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ROBERTSON GLAZING CONSTRUCTION

Glass

For
Industrial and Commercial
Buildings



HH **ROBERTSON** **CO**
BUILDING PRODUCTS BUILDING PRODUCTS
PITTSBURGH, PA., U. S. A.



JAN 26 '26

ROBERTSON GLAZING CONSTRUCTION

for
Industrial, Commercial and
Public Buildings



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Catalog 75

Cable Addresses

Home Office: ROBERTROOF, Pittsburgh

Export Division: ROBERTROOF, New York

London Office: ROBERTROOF, London

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BUILDING BUILDING
PRODUCTS PRODUCTS

PITTSBURGH, PA.

U. S. A.



CADILLAC MOTOR COMPANY, DETROIT, MICH.

This picture shows part of an installation of over 100,000 square feet of Robertson Double-pitch Glass Roof on one of the buildings of the Cadillac Motor Company's plant at Detroit, Michigan. It illustrates how ideally this type of glazing construction is adapted to increasing the well-lighted, usable floor area in modern industrial buildings.

ROBERTSON GLAZING CONSTRUCTION

ARCHITECTS, engineers, contractors, building owners—everyone who is concerned with the daylighting of industrial, commercial or public buildings will find a wealth of valuable information and data in this catalog of Robertson Glazing Construction.

This booklet is, in fact, more than a catalog. It describes the distinguishing characteristics, the various forms and the four outstanding advantages of Robertson Glazing Construction; but in this descriptive matter can be found accurate and dependable guidance for the efficient and economical solution of practically any problem of providing natural daylight for building interiors.

Four Outstanding Advantages

Robertson Glazing Construction offers four important and valuable advantages with which everyone who specifies or buys skylights for industrial buildings should be familiar:

1. *Unusually Long-lived Construction.* Robertson Glazing Construction is designed to do away with all avoidable glass breakage. This is accomplished by advanced features of design and by the use of materials of exceptional durability and perfect suitability to skylight construction.
2. *Positively Water-tight Construction.* Robertson Skylights are scientifically designed to eliminate leakage. Outside moisture is positively excluded.
3. *Exceptionally Wide Adaptability.* Robertson Glazing Construction is avail-

able in a great variety of forms and sizes to meet the daylighting requirements of practically every type of industrial or commercial building construction.

4. *Greater Economy.* Because of their unusual durability and because of their moderate first cost Robertson Skylights represent the utmost economy in glazing construction.

Long-lived Construction

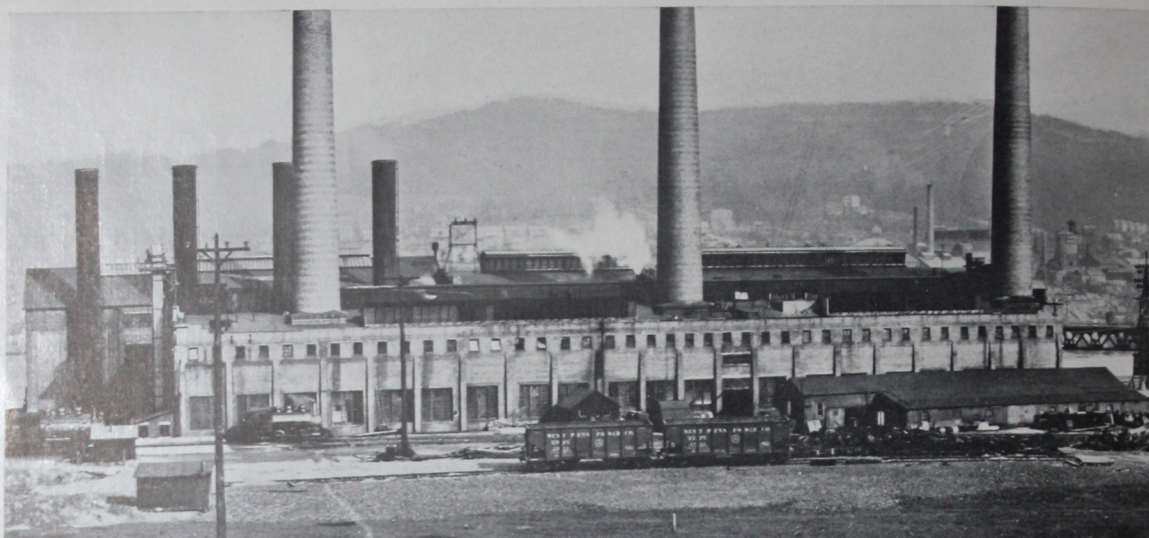
The chief causes of broken glass in skylights are deflection of supporting members and improper methods of glass cushioning and separating. Robertson Glazing Construction offers a double safeguard against glass breakage. It provides (1) a strong and firm foundation of rigid, durable supporting members and (2) a non-absorbent, resilient, permanent insulating bed and separator for the glass.

The Robertson Bar Beam

The foundation of Robertson Glazing Construction is a rolled steel bar (angle or channel) varying in size and shape as required. The bar is selected and designed so that under a given loading with a safety factor of 4 a deflection of $\frac{1}{30}$ " per lineal foot of span is never exceeded. This means that glass breakage will never result from lack of initial bar stiffness in Robertson Glazing Construction.

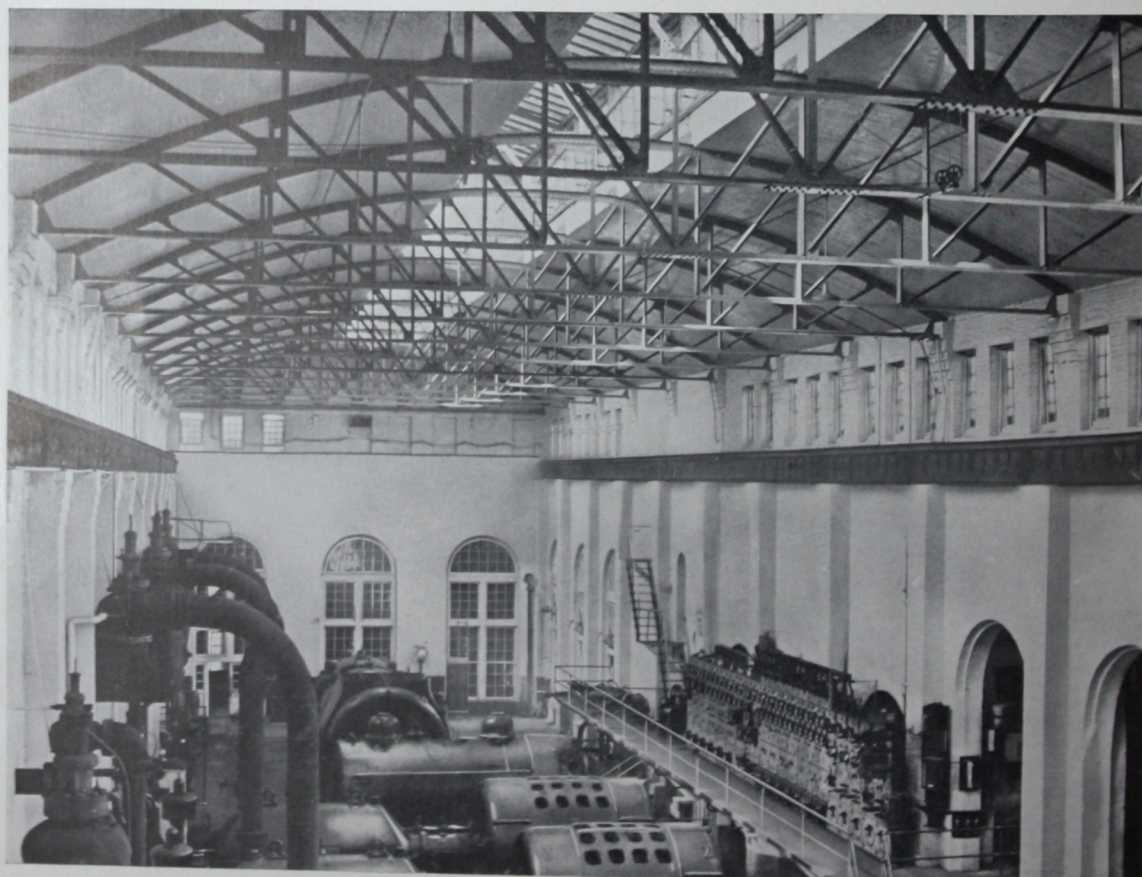
Everything Above The Bar

One of the most important differences between Robertson Skylights and other types of glazing construction, and



WEST PENN POWER COMPANY, CONNELLSVILLE, PA.

The service given by Robertson Double-pitch Glass Roofs installed on this power plant in 1920 has proved so satisfactory that the West Penn Power Company has since standardized on Robertson Glazing Construction. Robertson Asbestos Protected Metal is used for roofing on these buildings.



WEST PENN POWER COMPANY, CONNELLSVILLE, PA.

Interior of one of the buildings illustrated above. Robertson Glazing Construction is perfectly adapted to buildings such as this where drippage must be entirely eliminated. In this Robertson Skylight installation all condensation is caught by cross gutters and conducted to the main condensation gutters which carry it off.

one of the chief reasons for the longer life of service that Robertson Skylights will deliver, is the fact that every structural detail is placed above the bar beam. The bar serves just one function—that of a load carrying member. It is not called upon to serve the double purpose of bar and condensation gutter, as is the case with less durable types of glazing construction.

The Robertson Glass Cushion

In Robertson Glazing Construction, the glass rests on a resilient, permanent, non-metallic cushion with a cap above which maintains proper pressure, holds the glass securely and makes ample allowance for expansion, contraction, vibration and wind pressure. Thus, in Robertson Glazing Construction, the second principal cause of glass breakage is overcome.

Robertson Condensation Gutters

Robertson Skylights are fitted with condensation gutters correctly designed for maximum efficiency. These gutters add another element of durability to Robertson Glazing Construction. They effectively carry away all condensation without permitting it to come in contact with the supporting bars and weaken them through corrosion.

Asbestos Protected Metal Trim

A fourth factor of strength and durability in Robertson Skylights, and one which can be found in no other glazing construction, lies in the fact that condensation gutters, caps and trim can be made of Robertson Asbestos Protected Metal (see Type "B" pages 13 and 34). Robertson Glazing Construction, is, however, furnished with gutters, caps and trim of copper, galvanized

steel, or other suitable materials (see Type "A" page 11).

Architects, engineers and building owners who are familiar with Asbestos Protected Metal as a roofing and siding material will readily appreciate the advantage of the use of this enduring material in glazing construction. Because of its triple protective coating of (1) Asphalt, (2) Asbestos Felt and (3) Water-proofing, APM is proof against the corrosive action of water, smoke, steam, fumes and gases. Wherever APM is used painting is unnecessary. Repairs and upkeep expenses are practically eliminated. This protection can be given to skylight bars where unusually severe conditions are involved; but for most purposes painted bars are entirely satisfactory.

Water-tight Construction

In Robertson Skylights the possibility of leakage through structural defects is eliminated. Robertson Glazing Construction is positively water-tight. The strength and durability of the Robertson bar beams eliminate the danger of leakage through deflection of supporting members. Robertson Glass Cushions and Caps provide a strong but flexible bearing for the glass which conforms perfectly to the surface of the glass, insuring a tight, leak-proof installation.

Wide Adaptability

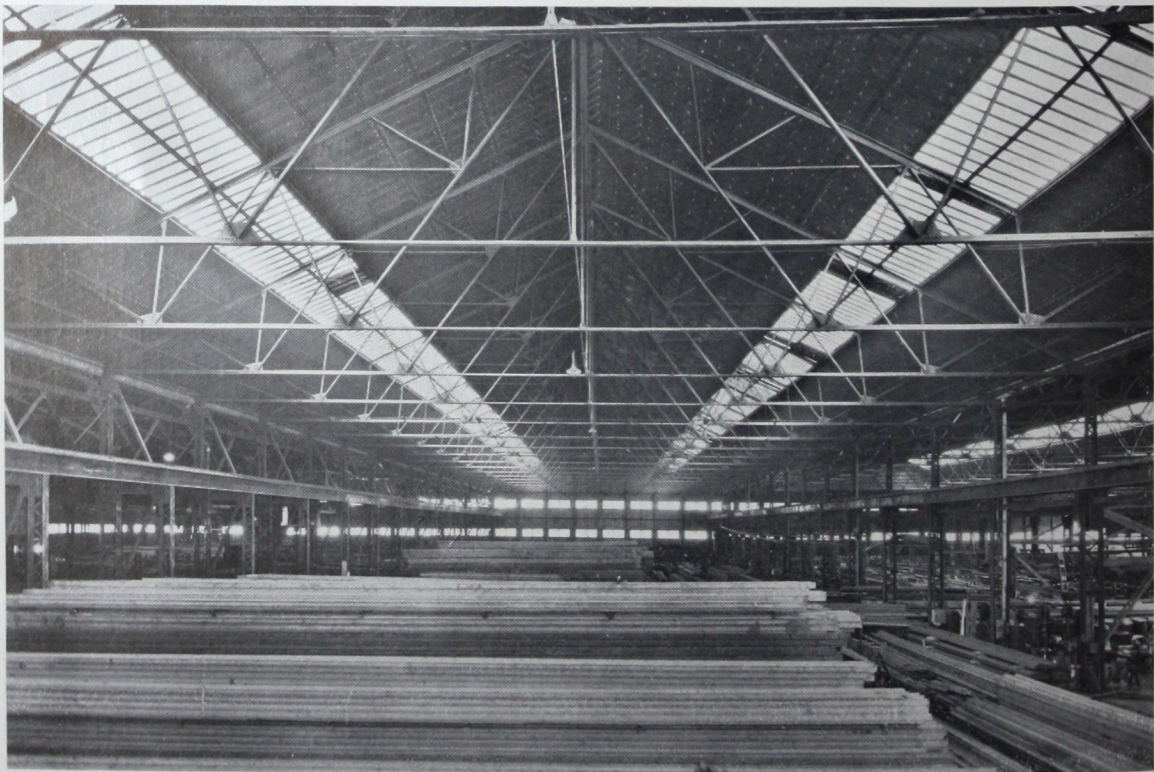
Robertson Glazing Construction is made in an exceptionally wide variety of forms and sizes to meet practically every daylighting requirement.

Robertson Skylights may be classified in four general groups, all having the same basic features of design and



JOSEPH T. RYERSON & COMPANY, CHICAGO, ILL.

On the Chicago plant of the above named company approximately 23,000 square feet of Robertson Single-Pitch Skylights have been erected. Robertson Asbestos Protected Metal is also in use on this and other buildings of the Ryerson Company. Here is a long-lived combination of roofing and glazing construction that will give years of resistance to every corrosive influence both inside and out.



JOSEPH T. RYERSON & COMPANY, CHICAGO, ILL.

This interior view of the Ryerson plant shows how Robertson Skylights furnish daylight far from the side walls of the building.

construction, but each suited to special uses.

1. Glass Roofs for large building areas.
2. Self-Supporting Skylights for any length and width within the limits of this type of construction.
3. Adaptable Skylights of any length desired and maximum curb to curb widths of 9' 8" for double pitch and 5' 9" for single pitch.
4. Monitor and Sawtooth, Top-Hung or Fixed Sash.

Robertson Glass Roofs

Robertson Glass Roofs are widely used to cover large light wells furnishing natural daylight to modern industrial and office buildings (see illustration of Cadillac installation on page 2). They are also extensively used to glaze over courts or between existing buildings, to provide more usable floor space without the construction of new buildings. Robertson Engineers will gladly go over your building plans and submit cost estimates for Robertson Glass Roofs.

Robertson Self-Supporting Skylights

Robertson Self-Supporting Skylights are available in any length desired. The out-to-out curb width may be anything up to 25 feet for the double pitch type and 14 feet for the single pitch type. Quotations will be sent on request for Robertson Self-Supporting Skylights to suit your requirements.

Robertson Adaptable Skylights

Robertson Adaptable Skylight is unquestionably one of the most important and significant developments in glazing construction that has taken place in

recent years. It is the result of long and exhaustive experiments by Robertson Engineers for the purpose of developing a standard skylight unit which could be easily and economically adapted to openings of various widths.

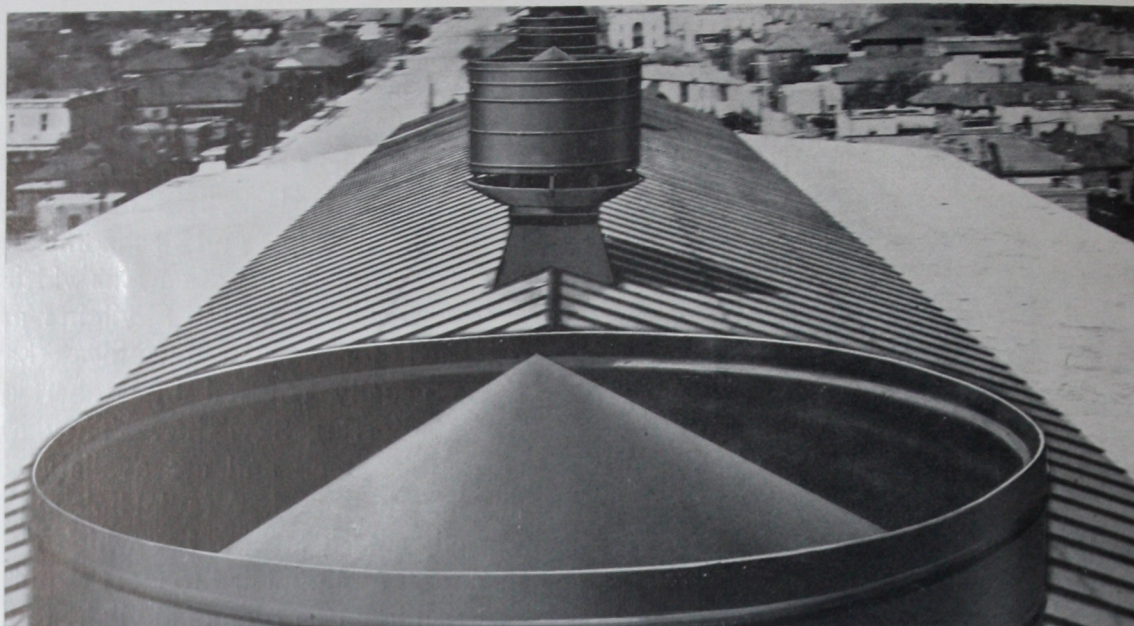
Robertson Adaptable Skylights are designed for smaller openings than those usually covered by Robertson Self-Supporting Skylights. They are carried in stock and are available in any length desired. A radial hole in the top clip and a locking bar which may be cut off and punched to meet requirements allow this type of skylight to be used on various widths of curbs up to 9' 8" for double pitch and 5' 9" for single pitch skylights by simply altering its pitch. We shall be glad to send you price lists giving quotations on Robertson Adaptable Skylights suited to your requirements.

Robertson Monitor and Sawtooth Sash

Robertson Monitor and Sawtooth Top-Hung and Fixed Sash have the same bars and trim as Robertson Skylights, except that condensation gutters are not included unless they are specified. Robertson construction prevents the possibility of water collecting on the outside of the sash on the bottom rail. Robertson Monitor Sash are built of full-formed structural shapes and are completely equipped ready for placing. Robertson Sawtooth Top-Hung Sash are riveted together making strong and structurally-correct connections.

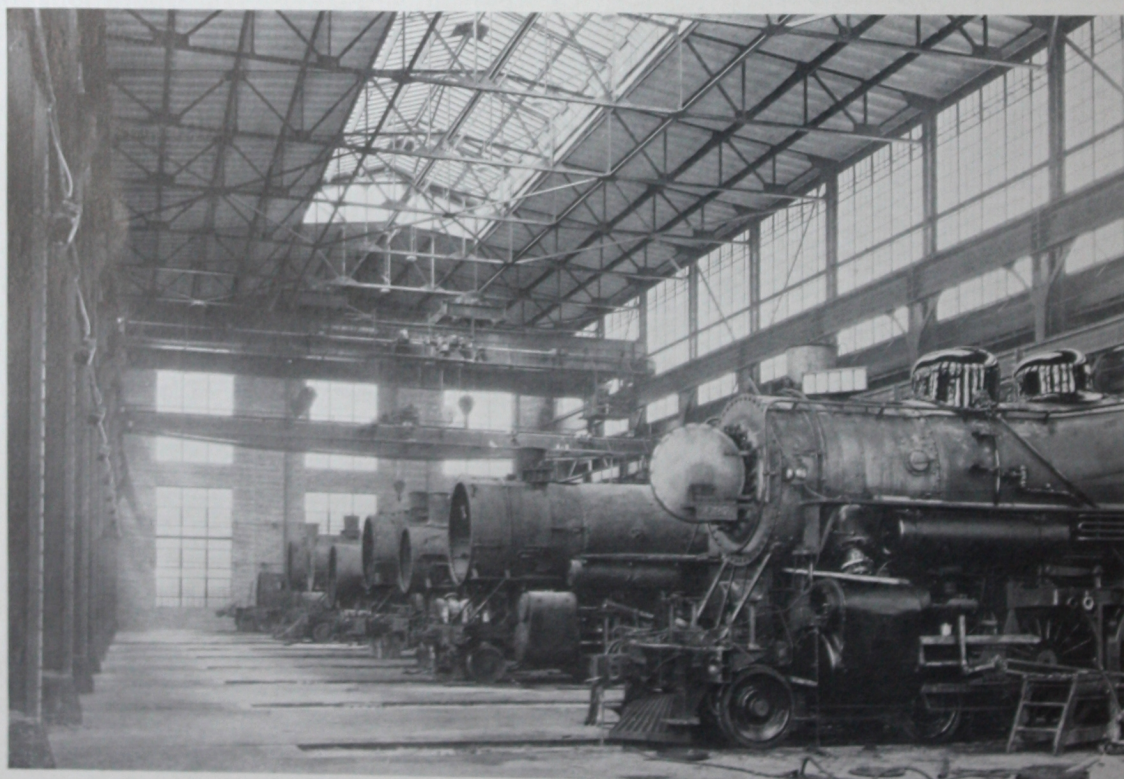
Double Glazing

Robertson Glass Roofs and Sash can be double glazed for use on textile, paper mills, over electrical equipment, on dye houses, and other buildings



SOUTHERN PACIFIC LINES, EL PASO, TEXAS

Illustrating an installation of over 5,000 square feet of Robertson Double-pitch Glass Roof on the new engine repair shop of the Southern Pacific Lines at El Paso, Texas. This picture shows how scientific ventilation can be combined with efficient natural lighting through the use of Robertson Glazing Construction equipped with Robertson Ventilators.



SOUTHERN PACIFIC LINES, EL PASO, TEXAS

This illustration shows the interior of the same building. Note how efficiently this type of Robertson Glazing Construction delivers an abundance of natural light exactly where it is needed. The strong and corrosion-proof construction of Robertson Glass Roofs makes them an ideal type of glazing construction for buildings such as this where heavy cranes are in constant operation and where smoke, steam and fumes from locomotives are prevalent.

where heat radiation and condensation are unusually severe. This system of glazing was developed to overcome the difficulties encountered where a great difference of temperature between the inside and the outside of the building exists, and more especially where the inside air carries an excessive degree of humidity. Where this condition exists, it is almost impossible to prevent leakage with the ordinary single glazed skylight, but here Robertson double glazing is especially applicable and does away with the danger of drippage on perishable goods.

By using two lights of glass, keeping them $1\frac{1}{8}$ " apart and providing a circulation of air between them, neither light is subjected to a great difference in temperature, and the moist air is forced to give up most of its water where it comes in contact with the outside light. Consequently, the upper surface of the inside light catches the condensation as it falls, discharging it into the internal gutters. The condensation on the inside surface of the inside light, being normal, runs down the glass and is conveyed away by the same gutter. In cases where glass is too long, cross gutters of the standard type are used on the inside light and special joining bars on the outside light.

Economy

The three important advantages of Robertson Skylights and Sash described above—longer life, leak-proof construction and wide adaptability—result in a fourth advantage—unusual economy.

The moderate first cost of Robertson Glazing Construction is spread over so many years of trouble-free service

that its cost per year is remarkably low. Permanence, freedom from leakage and glass breakage, the elimination of the necessity for painting and repairs, all combine to make Robertson Skylights and Sash the most economical type of glazing construction for buildings of every type. The wide adaptability of Robertson Glazing Construction and the fact that so many different types are carried in stock ready for quick assembly and easy erection bring further savings in the initial cost of skylight installations.

Engineering Service

Like all other Robertson Products, Robertson Glazing Construction is backed by a complete and efficient engineering service. The H. H. Robertson Company is more than a manufacturing organization. This company maintains a staff of skylight engineers of long and wide experience whose services are available without obligation to architects, engineers, contractors and building owners. The Robertson Engineering Department will cooperate to any extent that may be desired in the laying out and erection of skylight and sash installations.

The list on page 35 will give you an idea of how extensively Robertson Glazing Construction has been used on buildings of widely different types by leading corporations in every field. The pages including and following page 19 give specifications and detail drawings for all the various types of Robertson Skylights and Sash; in them can be found an efficient and economical solution for almost any problem involved in the daylighting of industrial, commercial and public buildings.



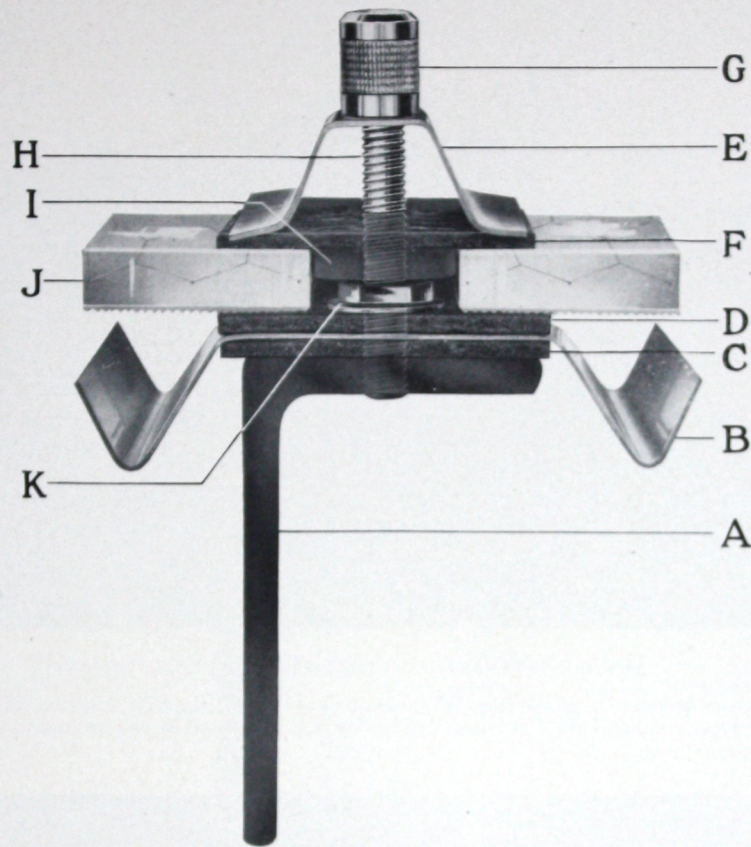
METROPOLITAN EDISON COMPANY, READING, PA.

This illustration shows part of an installation of approximately 4,000 square feet of Robertson Double-Pitch Skylights equipped with sixteen Robertson Ventilators. Here is a combination daylighting and ventilating installation that is permanent in every sense of the word. The necessity for painting is done away with. No repairs, upkeep expense or replacements for years to come.



METROPOLITAN EDISON COMPANY, READING, PA.

This picture shows the excellent daylighting result produced by the Robertson Skylights illustrated above. An abundance of fresh air is furnished by the Robertson Ventilators. The scientifically-designed condensation gutters on the Robertson Skylights effectively remove all condensation. The danger of drippage is eliminated. The result is ideal working conditions.



Cross-Section View

(TYPE A)

ROBERTSON GLAZING CONSTRUCTION

(A) *Rolled Steel Bar Beam.* Always sufficiently strong enough (regardless of span) to carry its load without deflection.

(B) *Copper or Galvanized Steel Condensation Gutter.* Not a part of the supporting member, but completely separated from the bar by insulation.

(C) *Insulation.* This insulation eliminates the possibility of electrolytic action between bar and condensation gutter.

(D) *Glass Cushion.* The glass rests on a durable, water-tight asphaltic cushion which, because of its flexibility and adhesive character, adapts itself to all irregularities in the surface of the glass, forming a continuous, leak-proof union.

(E) *Copper or Galvanized Steel Cap.* Scientifically designed, yet extremely simple in con-

struction. It is so constructed that it is perfectly rigid between the stud and the pressure it exerts is continuous and equal at all points.

(F) *Asphaltic Seal.* Seals the cap and glass together, entering all depressions and adhering to the glass.

(G) *Cap Nut and (H) Brass Stud.* These details clamp the glass between the flexible cushion, insulation and asphaltic seal, insuring permanent and water-proof joints.

(I) *Spacer.* Prevents the contact of glass with the lock nut.

(J) *Glass.* As specified.

(K) *Brass Lock Nut and Washer.* Holds the insulation and asphaltic cushion firm against the gutter.



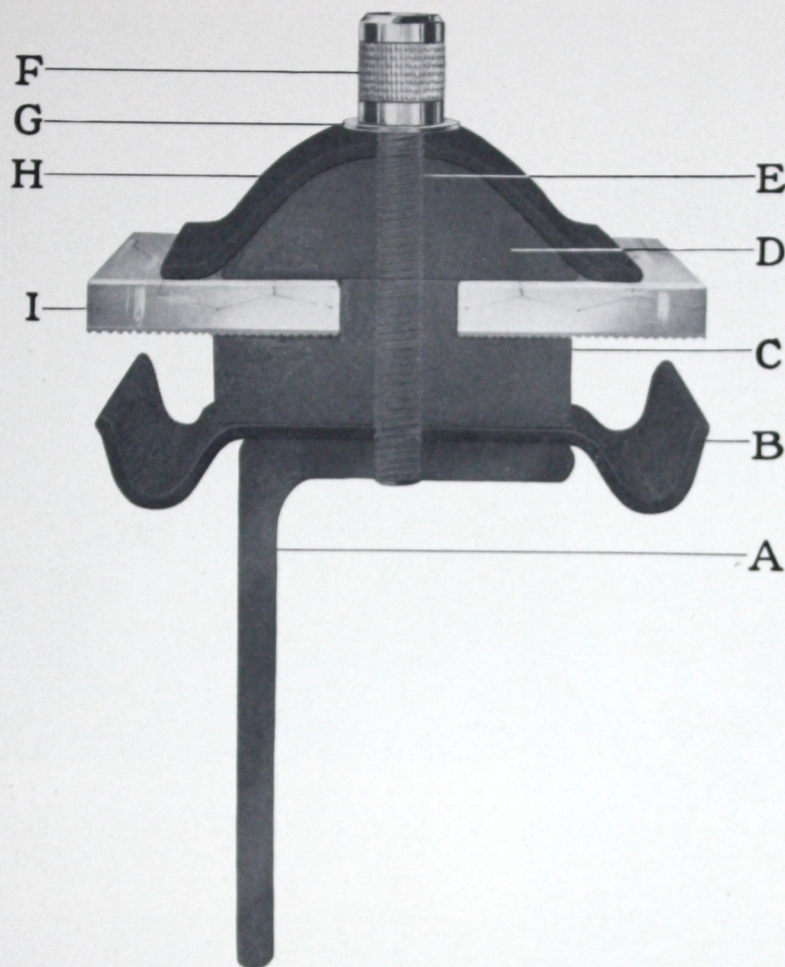
SESSIONS FOUNDRY COMPANY, BRISTOL, CONN.

This picture shows an installation of over 10,330 square feet of Robertson Double-Pitch Skylight, giving excellent service under the acid, fume and high humidity conditions that are found in and around buildings of this type.



SESSIONS FOUNDRY COMPANY, BRISTOL, CONN.

The interior of the building illustrated above. This installation of Robertson Skylights is an important factor in promoting the efficiency of employees working under conditions that call for natural light. The possibility of eye strain is eliminated. Artificial lighting is made unnecessary.



Cross-Section View

(TYPE B)

ROBERTSON GLAZING CONSTRUCTION

(A) *Rolled Steel Bar Beam.* Always sufficiently strong enough (regardless of span) to carry its load without deflection. Where corrosive conditions are particularly severe, the Bar (A) can be protected by the Robertson Process of Metal Protection. Painted bar is furnished unless otherwise specified.

(B) *Asbestos Protected Metal Condensation Gutter.* Fits snugly over the top of the bar, but is not an integral part thereof.

(C) *Glass Cushion and Separator.* The glass rests on a cushion of special high-grade asphaltic compound that provides a broad, continuous, permanent bed. This cushion is pliable, non-absorbent and durable. It positively keeps the glass from contact with all solid substances,

even the stud, thus preventing destructive strains.

(D) *Cap Filler.* The edges of the lights of glass and the joints between them are covered with a half-oval section of asphaltic compound similar to that used in the cushion. This filler enters all depressions and adheres to the glass.

(E) *Brass Stud and (F) Cap Nut.* These details clamp the glass between the flexible cushion and filler, insuring permanently water-proof joints.

(G) *Brass Washer.*

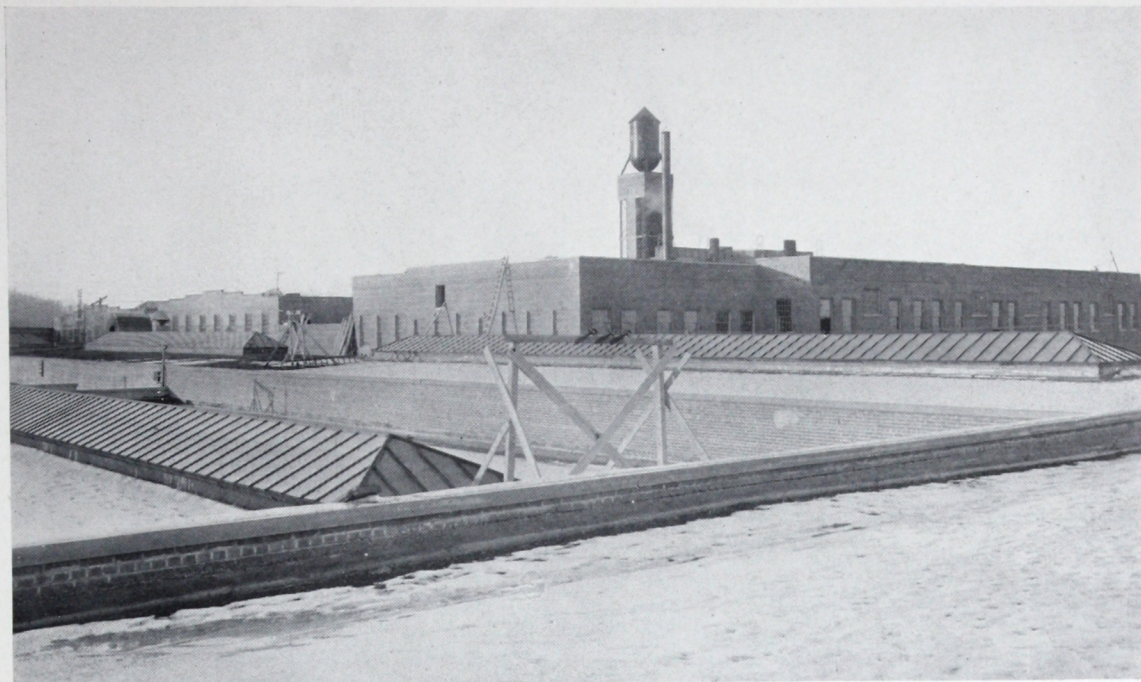
(H) *Asbestos Protected Metal Cap.* Protects the cap filler and distributes pressure evenly and continuously.

(I) *Glass.* As specified.



UNION STATION AT INDIANAPOLIS, INDIANA

Twelve Robertson Single-pitch Skylights, each 925 feet long, are installed on the train sheds of this station. Robertson Skylights with metal parts made of Asbestos Protected Metal make the ideal type of glazing construction for railroad buildings and other structures subjected to severe corrosive conditions. In railroad buildings the combination of sulphur dioxide fumes with excessive moisture results in a condensation of sulphurous acid that quickly eats away unprotected metal.



PRICE BROTHERS & COMPANY, LTD., KENOGAMI, QUE.

This company has installed ten Robertson Double Glazed Hip Skylights ranging in size from 8' 4" wide by 54' 6" long to 10' 0" wide by 126' 6" long, because of the manner in which the double glazing furnishes light where it is needed, insulates the buildings and, together with the bar gutters and other devices, prevents drippage, as well as because of the manner in which the skylights' Asbestos Protected Metal trim withstands the most severe steam and fume conditions encountered around paper mills.



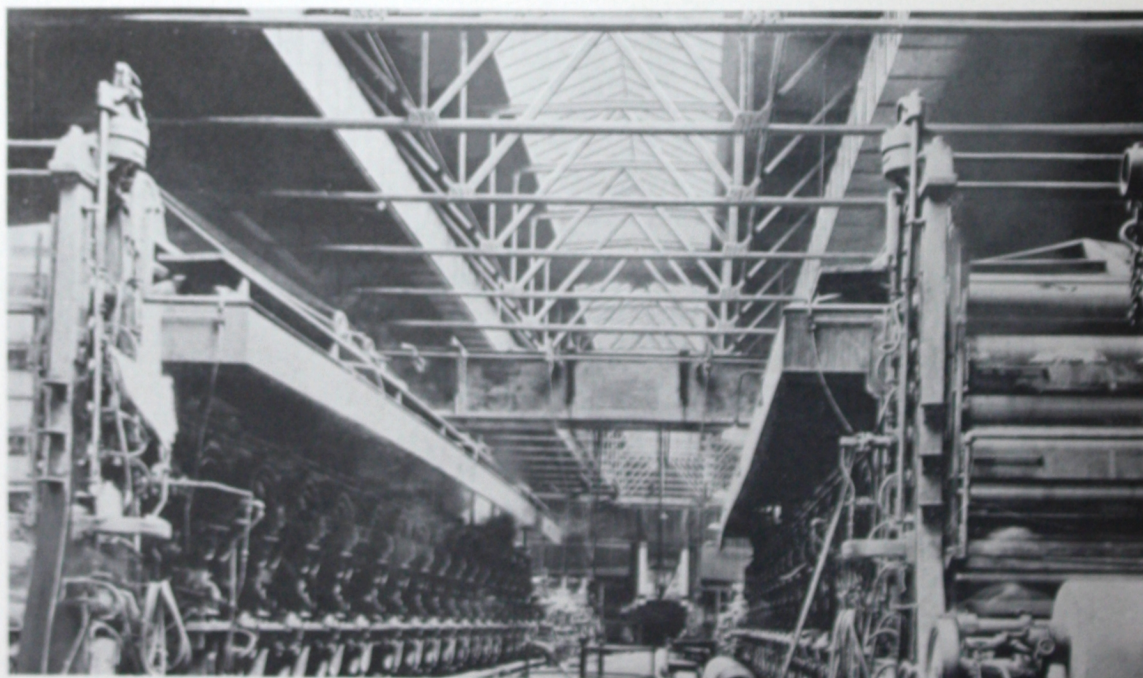
FISHER BODY CORPORATION, DETROIT, MICH.

This internationally known manufacturer of automobile bodies is a consistent user of Robertson Skylights, having installed 642,423 square feet on the Shepard Art Metal unit, the Ternstedt Manufacturing unit and the Pontiac plant. The above is an interior view of Robertson Skylights on their Plant No. 23. They have shown their confidence in the dependability and economy of Robertson Glazing construction in a practical way—by repeat orders.



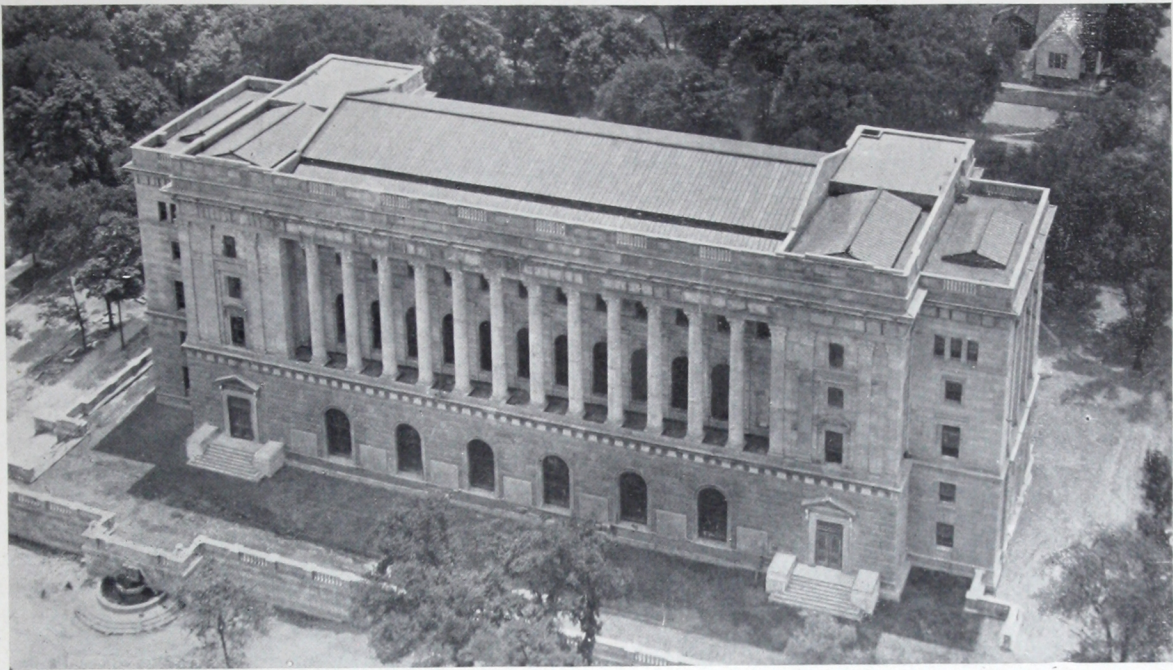
PRESSED STEEL CAR COMPANY, PITTSBURGH, PA.

This company has bought approximately 13,463 square feet of Robertson Glazing Construction. The above is an interior view of part of these skylights, over their paint shop, where good daylight is a prime necessity and destructive fumes are encountered.



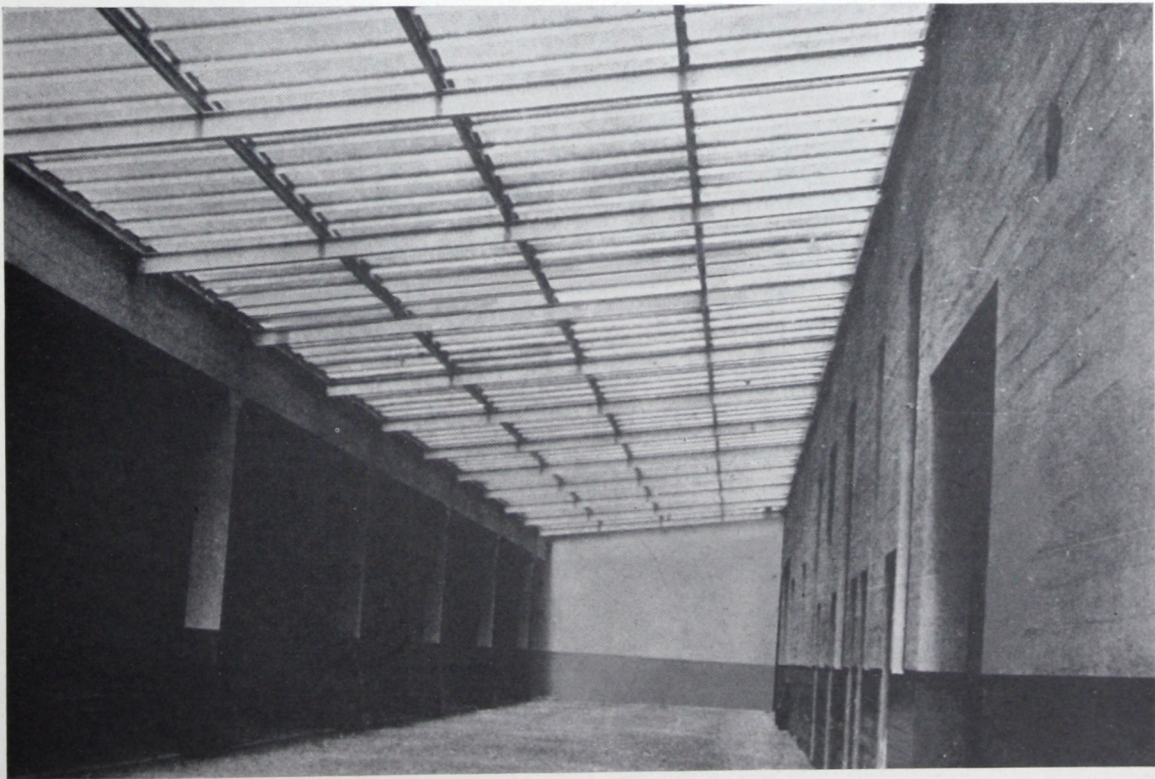
ST. CROIX PAPER COMPANY, WOODLAND, ME.

Interior view of part of a Robertson Double Glazed Double Pitch skylight installation over the machine rooms of the St. Croix Paper Company. Approximately 9,656 square feet are now in use. This type of construction is becoming increasingly popular among paper mill owners both in United States and Canada because of the manner in which the air space between the two roofs of glass, which constitute the double glazing, acts as an insulator and reduces condensation troubles.



CENTENNIAL MEMORIAL BUILDING, SPRINGFIELD, ILL.

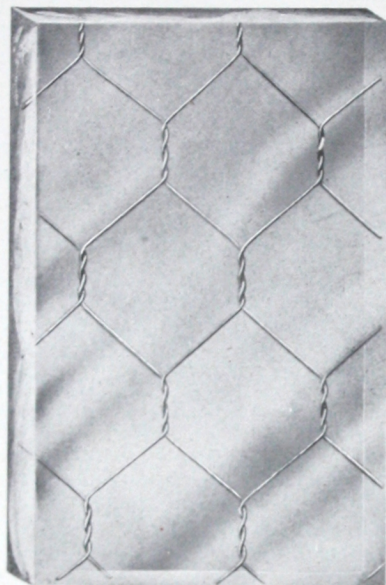
On this building 12,644 square feet of Robertson Skylights are in use, 6,000 square feet being used on the main skylight. Other notable buildings of splendid, high class construction on which Robertson Skylights have been erected are the Scottish Rite Cathedral, Guthrie, Okla.; Henry Ford Hospital, Detroit, Mich.; Traymore Hotel, Atlantic City, N. J.; Minnesota State Historical Society Building, St. Paul, Minn.; Chase Hotel, St. Louis, Mo.; University of Kansas, Lawrence, Kans.; and many others.



PACIFIC GAS & ELECTRIC COMPANY, SAN RAFAEL, CALIF.

The above picture shows how Robertson Skylight construction can be used to glass over open courts between existing structures thus providing additional covered, well-lighted space without the need of erecting new buildings.

Types of Glass Generally Used in Robertson Glazing Construction



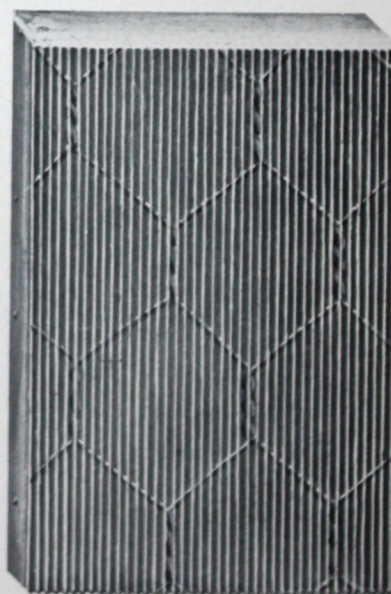
Polished Wire Glass



Pentecor Wire Glass



Hammered or Rough Wire Glass



Ribbed Wire Glass

NOTE. Glass of the same kind but without wire insertion is occasionally used.

Suggested Specifications for Skylights

ALL skylights shall be of the ROBERTSON putty-less construction (Type "A" or Type "B") as manufactured by the H. H. Robertson Company of Pittsburgh, Penna., and in accordance with detailed drawings to be submitted by manufacturer for the approval of architect, engineer or purchaser.

Glass supporting members shall be rolled steel bars designed so that the maximum deflection under normal loading shall not be greater than $\frac{1}{30}$ of an inch to lineal foot of span. Steel bars shall be thoroughly cleansed of all scale, grease and rust, and shall then be given one shop coat of paint.

The glass shall be (state thickness, make and kind). No light of glass shall be more than inches in width, nor more than inches in length. The glass shall be left free to expand without coming in contact with bolts or other rigid substances, and no light of glass shall be supported by another light. Glass shall have a broad and continuous bearing on firm non-absorbing and non-metallic cushioning material, which

shall be sufficiently resilient to adjust itself to any irregularities of the glass surface along its bearing line.

Ample provisions shall be made for carrying away all condensation which may be delivered from the under surface of the glass. In no case, however, shall any structural member carry away leakage or condensation.

All caps, condensation gutters, aprons and other sheet metal parts shall be made of Asbestos Protected Metal for Type "B" construction, or Copper, Galvanized Steel, or other suitable materials, for Type "A" construction.

All caps and other sheet metal parts shall be thoroughly secured in place by means of bolts. All anchorage clips shall be of painted steel and shall be secured to the skylight bars with sheradized bolts.

All curb and roof flashings shall be furnished and placed by the roofing contractor. These flashings shall be well connected and left ready to receive the skylight work.

Skylight work shall be leak proof, and all glass shall be left clean and free from cracks.

A Shorter Skylight Specification

ALL skylights shall be of the ROBERTSON putty-less construction (Type "A" or Type "B") as manufactured by the H. H. Robertson Company of Pittsburgh, Penna.

Glass supporting members shall be rolled steel bars painted. Glass shall be (state kind and thickness).

All sheet metal parts shall be of Asbestos Protected Metal for Type "B" construction, or Copper, Galvanized Steel, or other suitable materials, for Type "A" construction.

Stud bolts and nuts shall be of brass. All other bolts shall be sheradized and all anchorage clips or other exposed metal, except as above specified, shall be painted steel.

All curb and roof flashings shall be furnished and placed by the roofing contractor. These flashings shall be well connected and left ready to receive the skylight work.

Skylight work shall be leak proof, and all glass shall be left clean and free from cracks.

Estimates

PROPOSALS for Robertson skylights and other products, standard detail drawings, literature, the suggestions of the Company's Engineering Department, or any other information pertaining to its specialties may be freely obtained by addressing the Company or any of its agencies.

When estimates are desired on skylights the following data is essential:

Number of skylights.

Style (single or double pitch, hipped, etc.).

Dimensions of areas to be glazed.

Pitch of glass (or rise per lineal foot).

Kind and size of curbs.

Kind and size of purlins (if any).

Distance between curbs and purlins.

Distance between purlins.

Kind and thickness of glass desired.

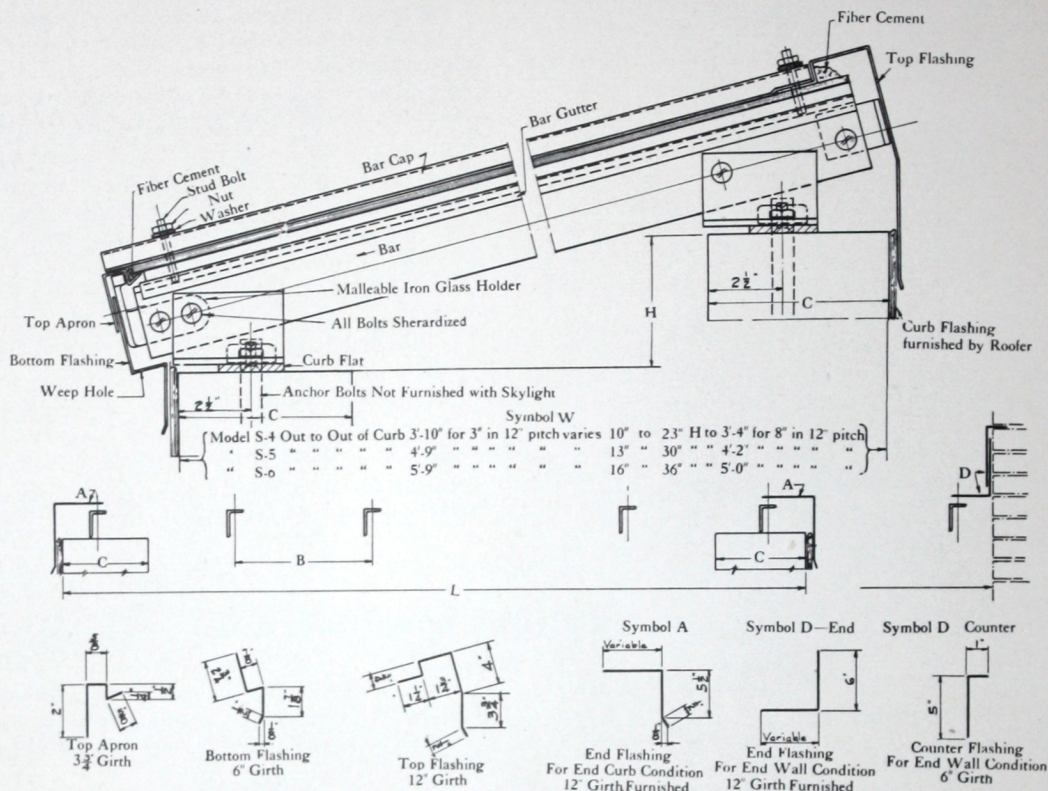
Kind of trim. (Note that Type "B" is furnished in Asbestos Protected Metal Trim only).

State whether steel bars are to be painted or Robertson Processed.

Kind of roofing to be used.

Most of the above mentioned data usually can be obtained from the roof plans, elevations, vertical cross section and detail drawings. If available, we will be glad to have them forwarded at our expense. They will be returned promptly, if desired.

ROBERTSON SINGLE PITCH ADAPTABLE SKYLIGHT



A—Flashing over curbs.

B—Bar spacings 18 3/4", 20 3/4", 22 3/4" or 24 3/4". These spacings take respectively 18", 20", 22" and 24" glass. Note that the purchaser may use any bar spacings he may desire as the bars are sold by the set and the curb flats and top and bottom flashings are in standard lengths.

D—Flashing and counter flashing furnished where skylight butts against wall.

Standard trim is galvanized steel.

Standard bars of black painted steel. A bar spacing of 22 3/4" is recommended for most purposes. We do not offer Asbestos Protected Metal or galvanized steel bars for this type of construction.

Pitch, as shown in the tabulation above, gives the various widths of the curb and their relative elevations that these bars will span. The practicable minimum pitch is 3" in 12".

Skylights designed for 25 pounds live load and 7 pounds dead load, with a maximum deflection of 1-30" per foot of span.

When ordering the customer should consider the following items as they will enable him to figure the proper amount of material needed:

Symbol W—Skylight width (out to out of curb). See details as shown above.

Symbol L—Skylight length (out to out of curb or face of wall).

Symbol B—Bar spacing (must be given if we furnish curb flats and top and bottom flashings).

Symbol C—Curb material and thickness.

Curb flats, top flashing, top apron, bottom flashing and side flashing may be purchased from the H. H. Robertson Company, or can be made locally.

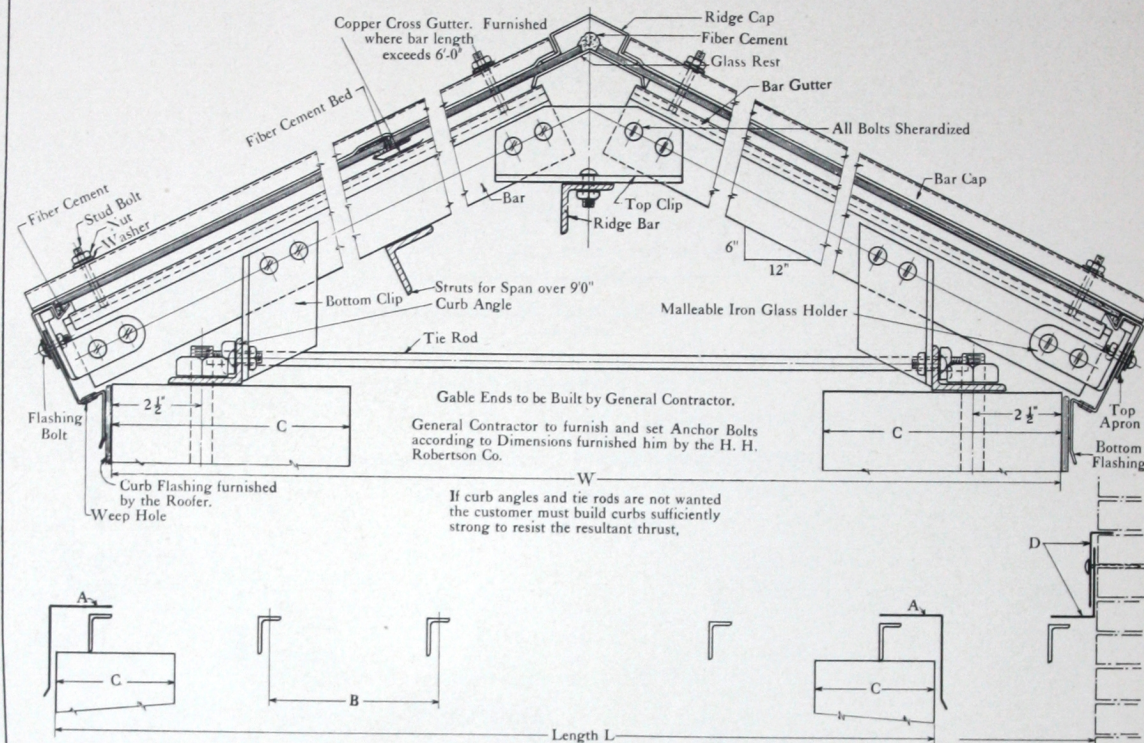
Complete parts for this skylight carried in stock.

The following patents apply to Robertson Skylight Construction

No. 1,115,714	Nov. 3, 1914	No. 1,156,335	Nov. 12, 1915	No. 1,167,949	Jan. 11, 1916
No. 1,168,599	Jan. 18, 1916	No. 1,195,090	Aug. 15, 1916	No. 1,227,861	May 29, 1917
No. 1,243,020	Oct. 16, 1917	No. 1,277,755	Sept. 3, 1918	No. 1,280,913	Oct. 8, 1918

Licensed under Patents Nos. 775,635 and 775,636. Other patents pending.

ROBERTSON DOUBLE PITCH SELF SUPPORTING SKYLIGHT



A—Flashings over curb.

B—Bar spacings 18 $\frac{3}{4}$ ", 20 $\frac{3}{4}$ ", 22 $\frac{3}{4}$ " or 24 $\frac{3}{4}$ " These spacings take respectively 18", 20", 22" and 24" glass.

D—Flashing and counter flashing where skylight butts against wall.

MAXIMUM SPAN "W" FOR VARIOUS SECTIONS

*2" x 1 $\frac{1}{2}$ " x $\frac{3}{16}$ " T=11'0"

2 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " x $\frac{1}{4}$ " L=14'6"

*2 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " x $\frac{3}{16}$ " L=13'0"

*3" C 4.1 Lbs. = 25'0"

*Members carried in stock.

Standard trim is Black Asbestos Protected Metal for Type B. Copper or Galvanized Steel for Type A.

Standard bars of black painted steel. Standard bar spacing of 22 $\frac{3}{4}$ " is recommended for most purposes. Prices for special Asbestos Protected Metal or galvanized steel bars on application.

Standard pitch 6" in 12". Other pitches special. Practical minimum pitch 3" in 12".

Skylights designed for 25 pounds live load and 7 pounds dead load, with a maximum deflection of 1-30" per foot of span.

When ordering always give

Symbol W—Skylight width (out to out of curb).

Symbol L—Skylight length (out to out of curb or face of wall).

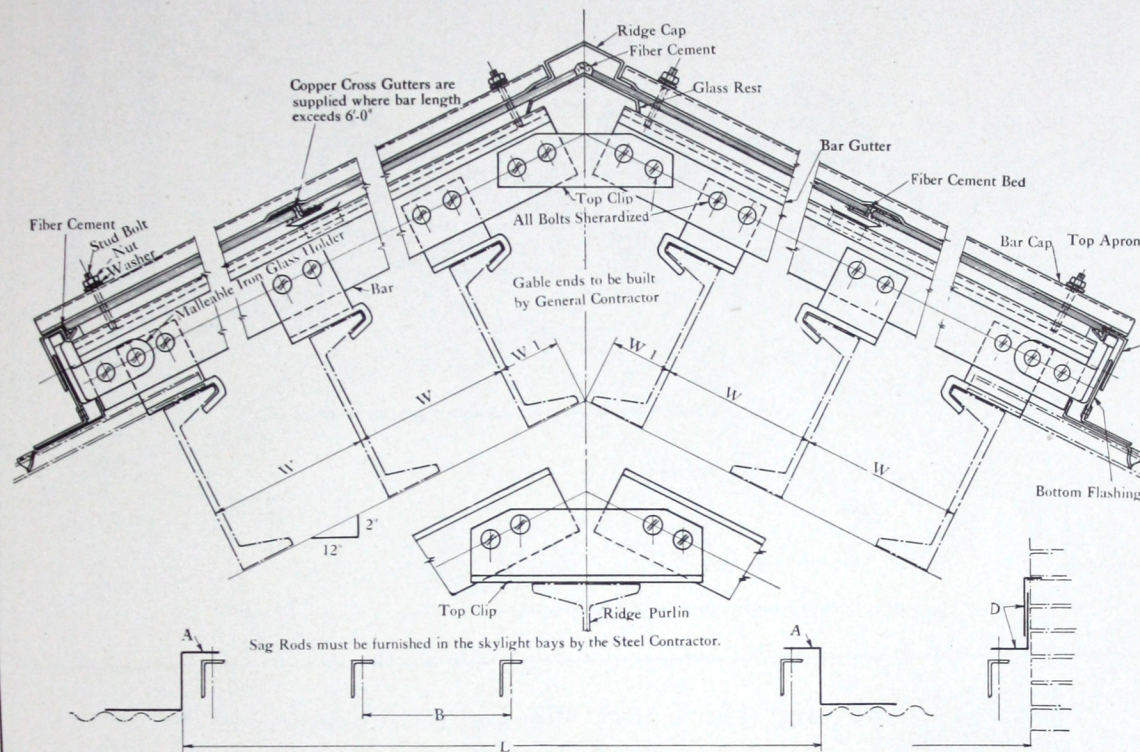
Symbol B—Bar spacing.

Symbol C—Curb material and thickness.

Quicker delivery and better prices can be secured by using standard construction as clips and other parts are carried in stock.

The following patents apply to Robertson Skylight Construction
 No. 1,115,714 Nov. 3, 1914 No. 1,156,335 Nov. 12, 1915 No. 1,167,949 Jan. 11, 1916
 No. 1,168,599 Jan. 18, 1916 No. 1,195,090 Aug. 15, 1916 No. 1,227,861 May 29, 1917
 No. 1,243,020 Oct. 16, 1917 No. 1,277,755 Sept. 3, 1918 No. 1,280,913 Oct. 8, 1918
 Licensed under Patents Nos. 775,635 and 775,636. Other patents pending.

ROBERTSON DOUBLE PITCH GLASS ROOF (Applied to Structural Steel)



A—End flashing.

B—Bar spacings $18\frac{3}{4}$ ", $20\frac{3}{4}$ ", $22\frac{3}{4}$ " or $24\frac{3}{4}$ ". These spacings take respectively 18", 20", 22" and 24" glass.

D—Flashing and counter flashing where skylight butts against wall.

MAXIMUM SPAN "W" FOR VARIOUS SECTIONS

*2" x $1\frac{1}{2}$ " x $\frac{3}{16}$ " T=6'0"

*2½" x $1\frac{1}{2}$ " x $\frac{3}{16}$ " L=7'6"

*Members carried in stock.

2½" x $1\frac{1}{2}$ " x $\frac{1}{4}$ " L= 7'6"

*3" □4.1 Lbs. =10'6"

Standard trim is Black Asbestos Protected Metal for Type B. Copper or Galvanized Steel for Type A.

Standard bars of black painted steel. Standard bar spacings of $22\frac{3}{4}$ " is recommended for most purposes. Prices for special Asbestos Protected Metal of galvanized steel bars upon application.

Standard pitch to accommodate roof. Practical minimum pitch is 2" in 12"

Skylight designed for 25 pounds live load and 7 pounds dead load, with a maximum deflection of 1-30" per foot of span.

When ordering always give

Symbol W —Skylight width (back to back of purlins. Give size and section of purlins. Also note whether toes are turned up or down the slope).

Symbol W1—Dimension between back of top purlin and intersection point.

Symbol L —Skylight length (give total length of opening)

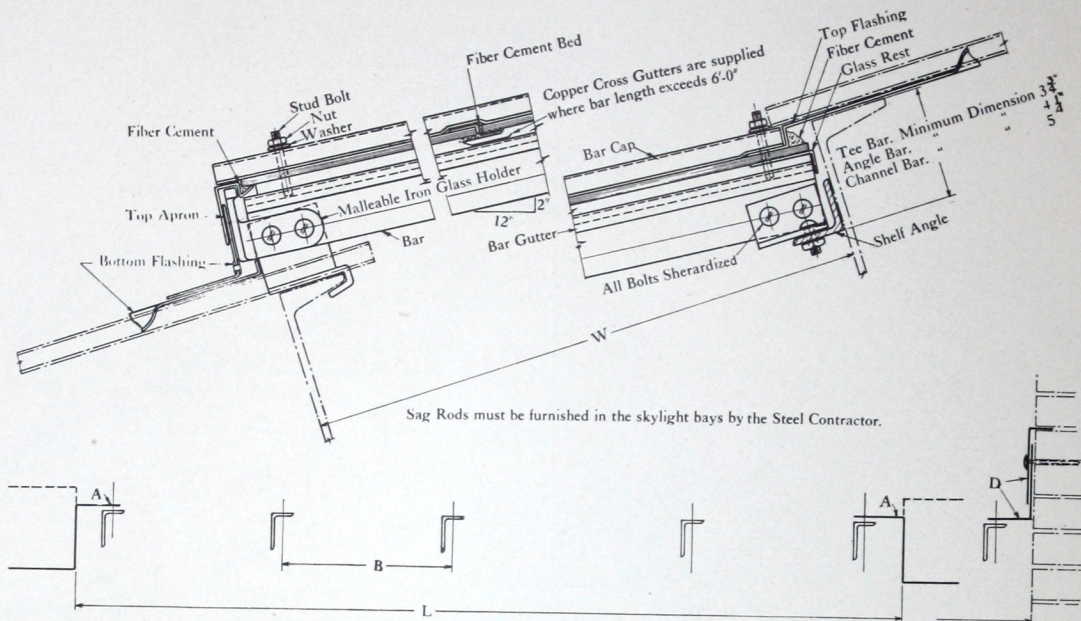
NOTE—Structural steel detail drawings must be sent to home office before fabrication will be started. Quicker delivery and better prices can be secured by using standard construction as clips and other parts are carried in stock.

The following patents apply to Robertson Skylight Construction

No. 1,115,714 Nov. 3, 1914	No. 1,156,335 Nov. 12, 1915	No. 1,167,949 Jan. 11, 1916
No. 1,168,599 Jan. 18, 1916	No. 1,195,090 Aug. 15, 1916	No. 1,227,861 May 29, 1917
No. 1,243,020 Oct. 16, 1917	No. 1,277,755 Sept. 3, 1918	No. 1,280,913 Oct. 8, 1918

Licensed under Patents Nos. 775,635 and 775,636. Other patents pending.

ROBERTSON SINGLE PITCH SINGLE SPAN SKYLIGHT (Depressed Head)



- A—End flashings.
B—Bar spacings 18 $\frac{3}{4}$ " 20 $\frac{3}{4}$ ", 22 $\frac{3}{4}$ " or 24 $\frac{3}{4}$ ". These spacings take respectively 18", 20", 22" and 24" glass.
D—Flashing and counter flashing where skylight butts against wall.

MAXIMUM SPAN "W" FOR VARIOUS SECTIONS

*2"x 1 $\frac{1}{2}$ "x $\frac{3}{16}$ " T=6'0"	2 $\frac{1}{2}$ "x1 $\frac{1}{2}$ "x $\frac{1}{4}$ " L= 7'6"
*2 $\frac{1}{2}$ "x1 $\frac{1}{2}$ "x $\frac{3}{16}$ " L=7'0"	*3" C4.1 Lbs. =10'6"

*Members carried in stock.

Standard trim is Black Asbestos Protected Metal for Type B. Copper or Galvanized Steel for Type A.

Standard bars of black painted steel. Standard bar spacing of 22 $\frac{3}{4}$ " is recommended for most purposes. Prices for special Asbestos Protected Metal or galvanized steel bars on application.

Standard pitch to accommodate roof. Practical minimum pitch 2" in 12".

Skylight designed for 25 pounds live load and 7 pounds dead load, with a maximum deflection of 1-30" per foot of span.

When ordering always give

Symbol W—Skylight width (back to back of purlins. Give size and section of purlins. Also note whether toes are turned up or down the slope).

Symbol L—Skylight length (give total length of opening).

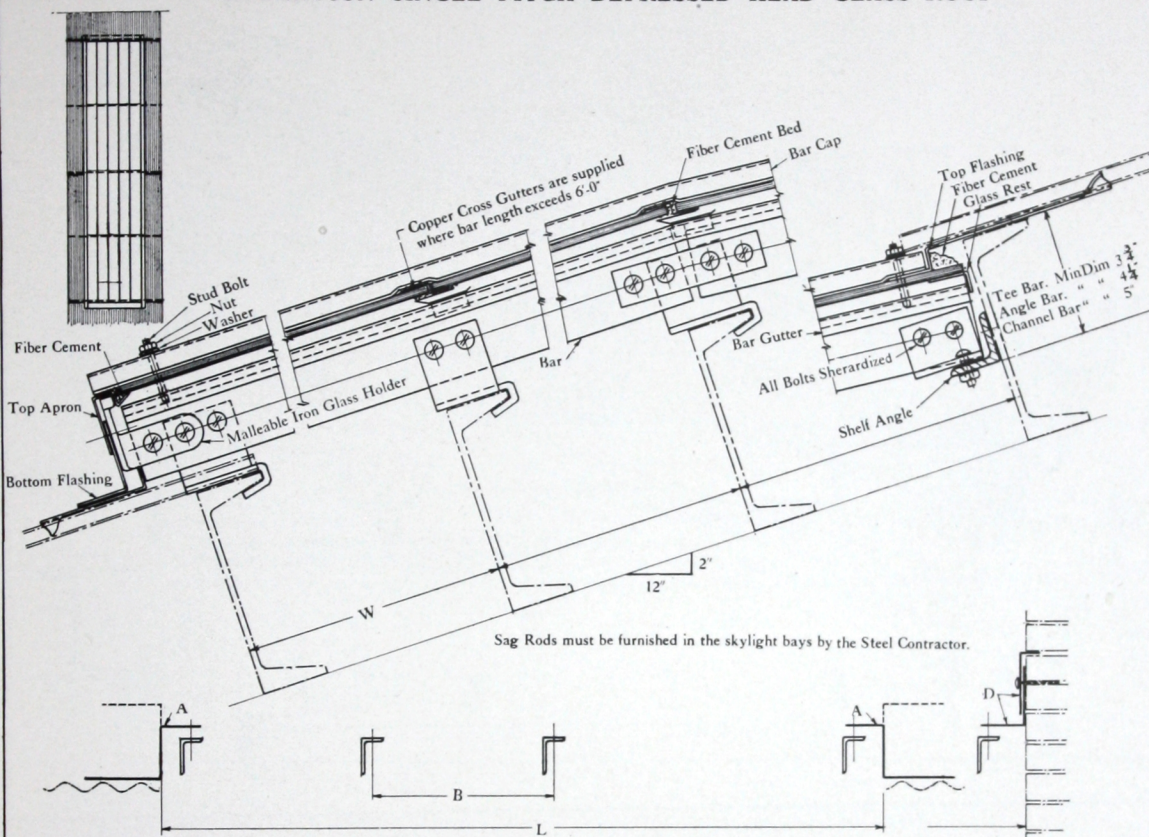
Symbol B—Bar spacing.

NOTE—Structural steel detail drawings must be sent to home office before fabrication will be started.

Quicker delivery and better prices can be secured by using standard construction as clips and other parts are carried in stock.

The following patents apply to Robertson Skylight Construction
No. 1,115,714 Nov. 3, 1914 No. 1,156,335 Nov. 12, 1915 No. 1,167,949 Jan. 11, 1916
No. 1,168,599 Jan. 18, 1916 No. 1,195,090 Aug. 15, 1916 No. 1,227,861 May 29, 1917
No. 1,243,020 Oct. 16, 1917 No. 1,277,755 Sept. 3, 1918 No. 1,280,913 Oct. 8, 1918
Licensed under Patents Nos. 775,635 and 775,636. Other patents pending.

ROBERTSON SINGLE PITCH DEPRESSED HEAD GLASS ROOF



A—End flashing.

B—Bar spacings 18 $\frac{3}{4}$ ", 20 $\frac{3}{4}$ ", 22 $\frac{3}{4}$ " or 24 $\frac{3}{4}$ ". These spacings take respectively 18", 20", 22" and 24" glass.

D—Flashing and counter flashing where skylight butts against wall.

MAXIMUM SPAN "W" FOR VARIOUS SECTIONS

*2" x 1 $\frac{1}{2}$ " x $\frac{3}{16}$ " T=6'0"

*2 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " x $\frac{3}{16}$ " L=7'0"

*Members carried in stock.

2 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " x $\frac{1}{4}$ " L=7'6"

*3" C4.1 Lbs. =10'6"

Standard trim is Black Asbestos Protected Metal for Type B. Copper or Galvanized Steel for Type A.

Standard bars of black painted steel. Standard bar spacings of 22 $\frac{3}{4}$ " is recommended for most purposes. Prices for special Asbestos Protected Metal or galvanized steel bars upon application.

Standard pitch to accommodate roof. Practical minimum pitch is 2" in 12".

Skylight designed for 25 pounds live load and 7 pounds dead load, with a maximum deflection of 1-30" per foot of span.

When ordering always give

Symbol W—Skylight width (back to back of purlins. Give size and section of purlins. Also note whether toes are turned up or down the slope).

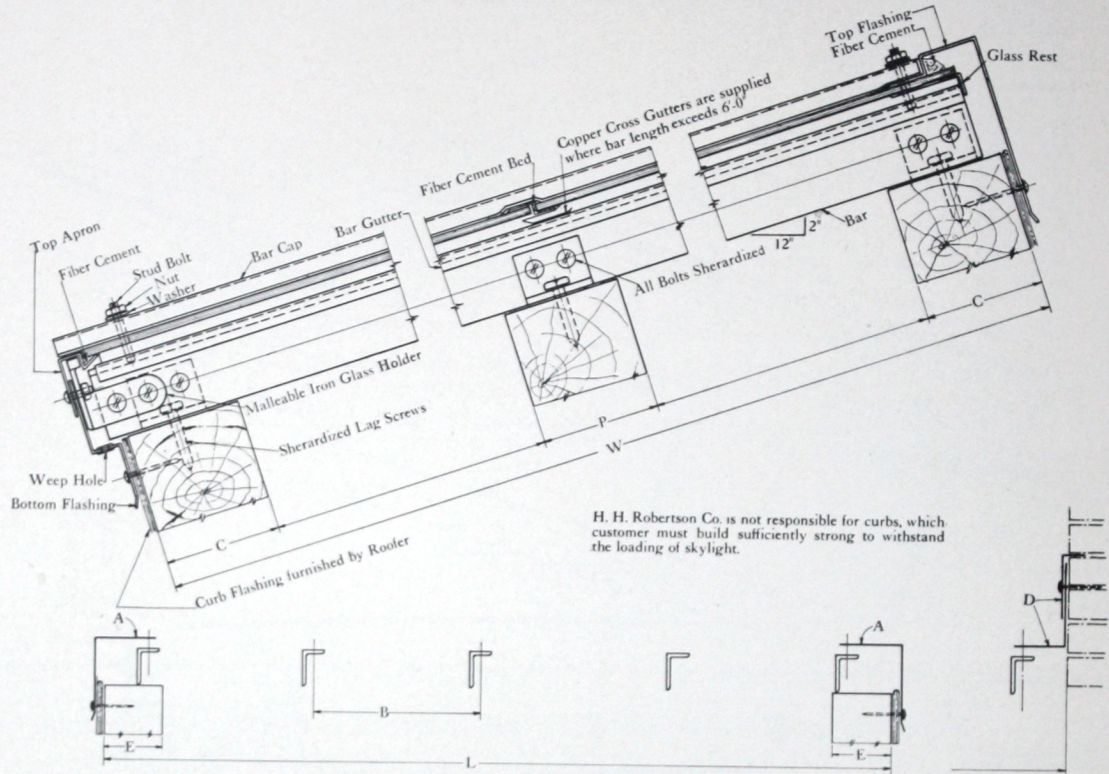
Symbol L—Skylight length (give total length of opening).

Symbol B—Bar spacing.

NOTE—Structural steel detail drawings must be sent to home office before fabrication will be started. Quicker delivery and better prices can be secured by using standard construction as clips and other parts are carried in stock.

The following patents apply to Robertson Skylight Construction
 No. 1,115,714 Nov. 3, 1914 No. 1,156,335 Nov. 12, 1915 No. 1,167,949 Jan. 11, 1916
 No. 1,168,599 Jan. 18, 1916 No. 1,195,090 Aug. 15, 1916 No. 1,227,861 May 29, 1917
 No. 1,243,020 Oct. 16, 1917 No. 1,277,755 Sept. 3, 1918 No. 1,280,913 Oct. 8, 1918
 Licensed under Patents Nos. 775,635 and 775,636. Other patents pending.

ROBERTSON SINGLE PITCH SKYLIGHT (Wood Curb and Purlin Type)



H. H. Robertson Co. is not responsible for curbs, which customer must build sufficiently strong to withstand the loading of skylight.

A—Flashing over curb.

B—Bar spacings $18\frac{3}{4}$ ", $20\frac{3}{4}$ ", $22\frac{3}{4}$ " and $24\frac{3}{4}$ ". These spacings take respectively 18", 20", 22" and 24" glass.

D—Flashing and counter flashing where skylight butts against wall.

MAXIMUM SPAN "W" FOR VARIOUS SECTIONS

* $2\frac{1}{2}$ " x $1\frac{1}{2}$ " x $\frac{3}{16}$ " T = 6'0"

* $2\frac{1}{2}$ " x $1\frac{1}{2}$ " x $\frac{3}{16}$ " L = 7'0"

*Members carried in stock.

$2\frac{1}{2}$ " x $1\frac{1}{2}$ " x $\frac{1}{4}$ " L = 7'6"

*3" C 4.1 Lbs. = 10'6"

Standard trim is Black Asbestos Protected Metal for Type B. Copper or Galvanized Steel for Type A.

Standard bars of black painted steel. Standard bar spacing of $22\frac{3}{4}$ " is recommended for most purposes. Prices for special Asbestos Protected Metal or galvanized steel bars on application.

Standard pitch to accommodate roof. Minimum pitch is 2" in 12".

Skylights designed for 25 pounds live load and 7 pounds dead load, with a maximum deflection of 1-30" per foot of span.

When ordering always give

Symbol W—Skylight width (out to out of curb).

Symbol L—Skylight length (out to out of curb or face of wall).

Symbol B—Bar spacing.

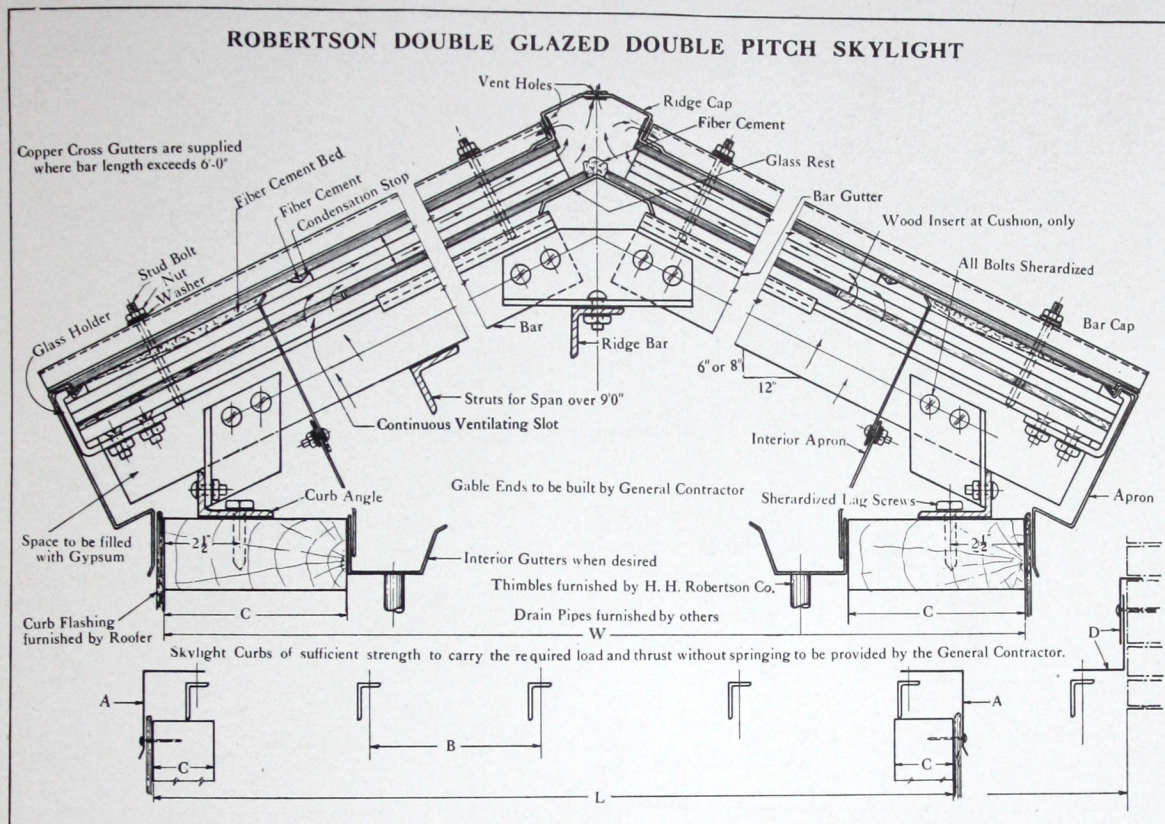
Symbol C—Curb material and thickness.

Symbol P—Give size of purlins and distance between purlins. Then intermediate purlins are not required, omit Symbol P.

Symbol E—If side curbs differ in width from those given for Symbol C.

Quicker delivery and better prices can be secured by using standard construction as clips and other parts are carried in stock.

The following patents apply to Robertson Skylight Construction
No. 1,115,714 Nov. 3, 1914 No. 1,156,335 Nov. 12, 1915 No. 1,167,949 Jan. 11, 1916
No. 1,168,599 Jan. 18, 1916 No. 1,195,090 Aug. 15, 1916 No. 1,227,861 May 29, 1917
No. 1,243,020 Oct. 16, 1917 No. 1,277,755 Sept. 3, 1918 No. 1,280,913 Oct. 8, 1918
Licensed under Patents Nos. 775,635 and 775,636. Other patents pending.



- A—Flashing over curb.
 B—Bar spacings 18 3/4" and 20 3/4". These spacings take respectively 18" and 20" glass.
 D—Flashing and counter flashing where skylight butts against wall.

MAXIMUM SPAN "W" FOR VARIOUS SECTIONS

2" x 1 1/2" x 3/16" T = 9'0"	2 1/2" x 1 1/2" x 1/4" L = 12'6"
2 1/2" x 1 1/2" x 3/16" L = 11'0"	3" C4.1 Lbs. = 20'6"
*Members carried in stock.	

Standard trim is Black Asbestos Protected Metal for Type B. Copper or Galvanized Steel for Type A.

Standard bars of black painted steel. Standard bar spacing of 20 3/4" recommended for double glazed skylights. Prices for special Asbestos Protected Metal or galvanized steel bars upon application.

Standard pitches 6" or 8" in 12". Other pitches special. Lower pitches than the standard are undesirable because of greater thrust against curbs.

Double glazed skylights designed for 35 pounds live load and 11 pounds dead load, with a maximum bar deflection of 1-30" per foot of span.

When ordering always give

- Symbol W—Skylight width.
- Symbol L—Skylight length (out to out of curb, or face of wall).
- Symbol B—Bar spacing.
- Symbol C—Wood plate curb should have 6" minimum width.

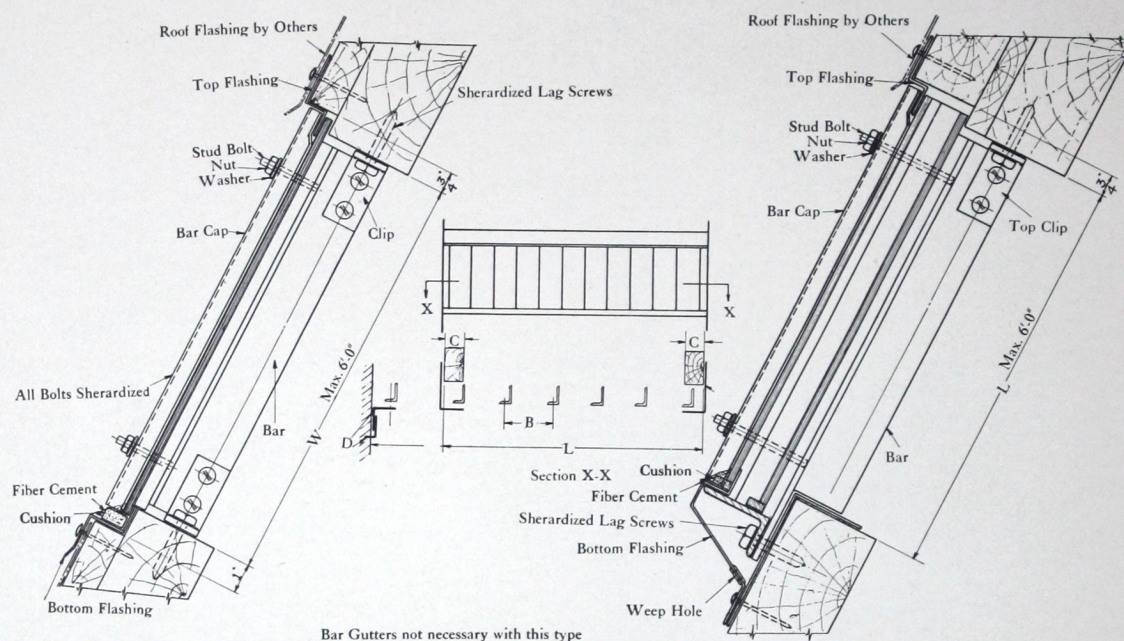
Quicker delivery and better prices can be secured by using standard construction as clips and other parts are carried in stock.

The following patents apply to Robertson Skylight Construction

No. 1,115,714	Nov. 3, 1914	No. 1,156,335	Nov. 12, 1915	No. 1,167,949	Jan. 11, 1916
No. 1,168,599	Jan. 18, 1916	No. 1,195,090	Aug. 15, 1916	No. 1,227,861	May 29, 1917
No. 1,243,020	Oct. 16, 1917	No. 1,277,755	Sept. 3, 1918	No. 1,280,913	Oct. 8, 1918

Licensed under Patents Nos. 775,635 and 775,636. Other patents pending.

ROBERTSON SINGLE AND DOUBLE GLAZED SAWTOOTH SASH (WOOD FRAMING)



A—End Flashings.

B—Bar spacings $18\frac{3}{4}$ ", $20\frac{3}{4}$ ", $22\frac{3}{4}$ " or $24\frac{3}{4}$ ". These spacings take respectively 18", 20", 22" and 24" glass.

D—Flashing and counter flashing where sawtooth butts against wall.

Standard trim is Black Asbestos Protected Metal for Type B. Copper or Galvanized Steel for Type A.

Standard bars of black painted steel. Standard bar spacing of $24\frac{3}{4}$ " is recommended for most purposes. Prices for special Asbestos Protected Metal or galvanized steel bars upon application.

Sash designed for 25 pounds live load and 7 pounds dead load, with a maximum deflection of 1-30" per foot.

When ordering always give

Symbol W—Sash height (out to out of curb, maximum 6'0").

Symbol L—Sash length (out to out ends, or face of wall).

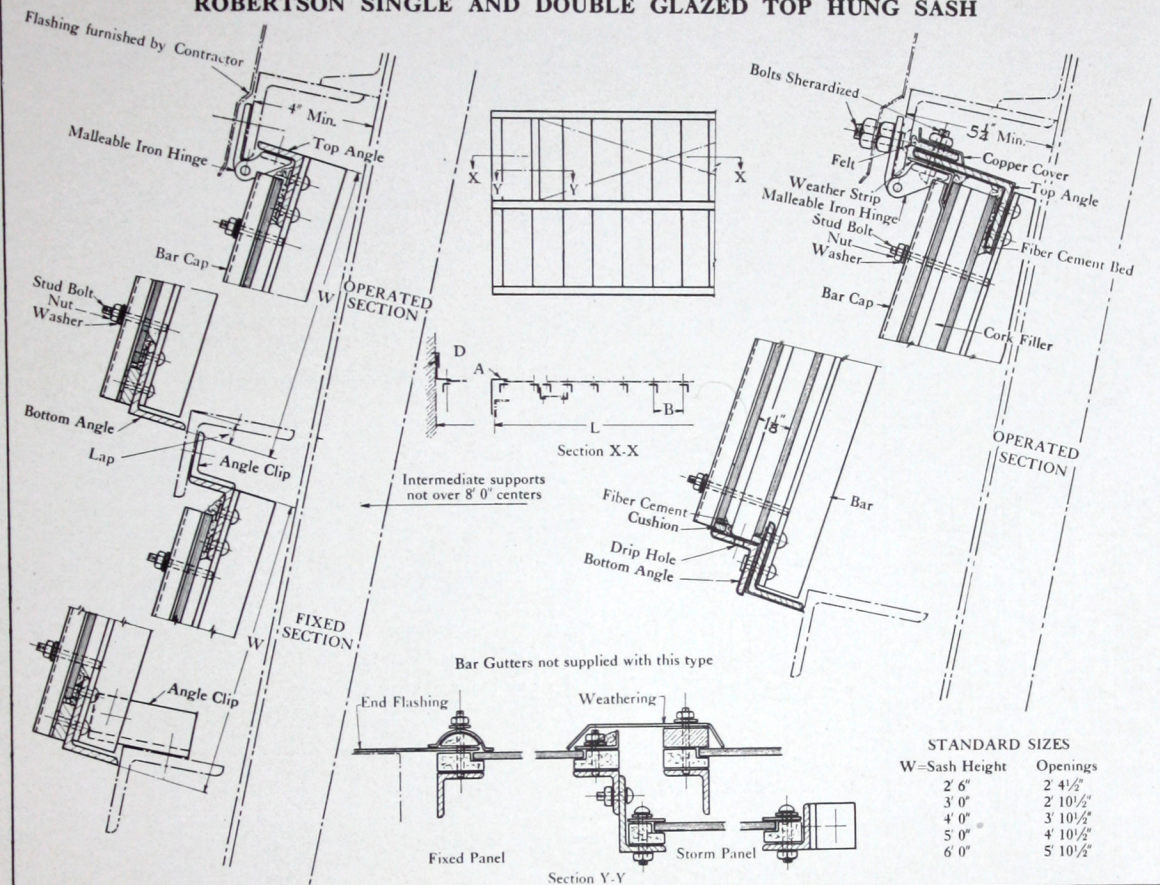
Symbol B—Bar spacing.

Symbol C—End material and thickness.

Quicker delivery and better prices can be secured by using standard construction as clips and other parts are stocked.

The following patents apply to Robertson Skylight Construction
 No. 1,115,714 Nov. 3, 1914 No. 1,156,335 Nov. 12, 1915 No. 1,167,949 Jan. 11, 1916
 No. 1,168,599 Jan. 18, 1916 No. 1,195,090 Aug. 15, 1916 No. 1,227,861 May 29, 1917
 No. 1,243,020 Oct. 16, 1917 No. 1,277,755 Sept. 3, 1918 No. 1,280,913 Oct. 8, 1918
 Licensed under Patents Nos. 775,635 and 775,636. Other patents pending.

ROBERTSON SINGLE AND DOUBLE GLAZED TOP HUNG SASH



A—End flashing.

B—Bar spacings 18 3/4", 20 3/4", 22 3/4" or 24 3/4". These spacings take respectively 18", 20", 22" and 24" glass.

D—Flashing and counter flashing where sawtooth butts against wall.

Standard bars of black painted steel. Standard bar spacing of 24 3/4" is recommended for most purposes. Prices for special Asbestos Protected Metal or galvanized steel bars upon application.

Sash designed for 25 pounds live load and 7 pounds dead load, with a maximum bar deflection of 1-30" per foot.

When ordering always give

Symbol W—Sash height (2'6"; 3'0"; 4'0"; 5'0" and 6'0" are standard).

Symbol L—Sash length (out to out ends, or face of wall).

Symbol B—Bar spacing.

Symbol C—End material and thickness.

STEEL DETAILS MUST ALWAYS BE FURNISHED WITH AN ORDER FOR THIS TYPE OF CONSTRUCTION.

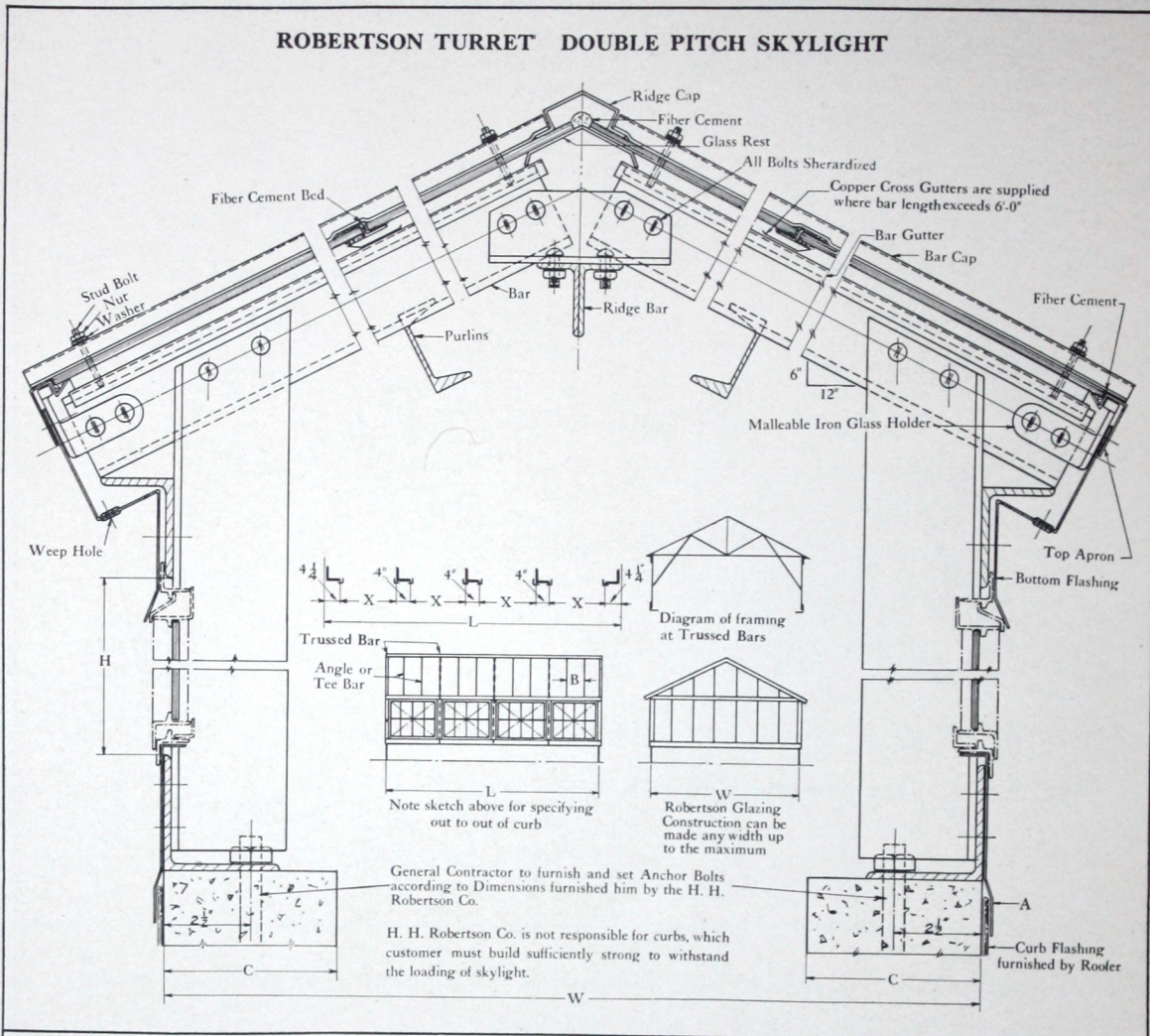
Quicker delivery and better prices can be secured by using standard construction, as clips and other parts are carried in stock. The double glazed construction is always special.

The following patents apply to Robertson Skylight Construction

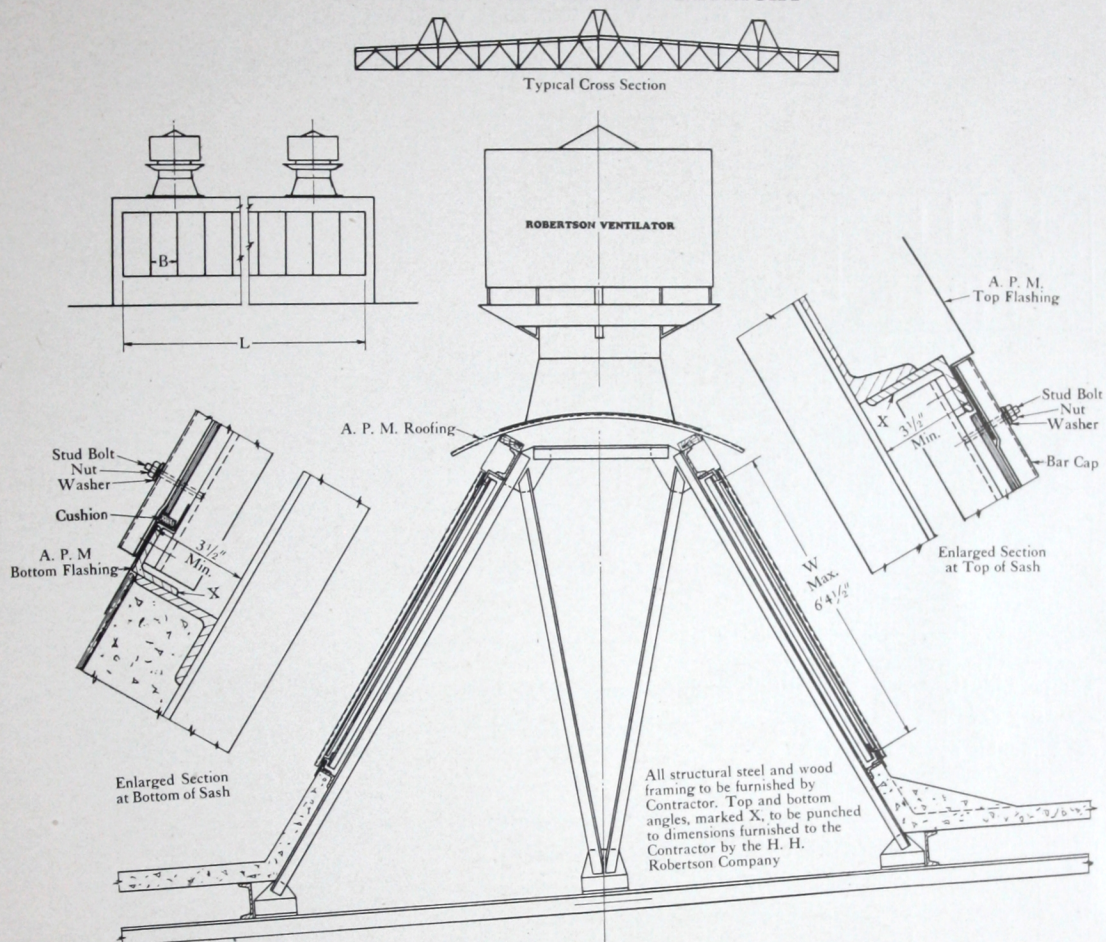
No. 1,115,714 Nov. 3, 1914	No. 1,156,335 Nov. 12, 1915	No. 1,167,949 Jan. 11, 1916
No. 1,168,599 Jan. 18, 1916	No. 1,195,090 Aug. 15, 1916	No. 1,227,861 May 29, 1917
No. 1,243,020 Oct. 16, 1917	No. 1,277,755 Sept. 3, 1918	No. 1,280,913 Oct. 8, 1918

Licensed under Patents Nos. 775,635 and 775,636. Other patents pending.

ROBERTSON TURRET DOUBLE PITCH SKYLIGHT



ROBERTSON VENTILATING SKYLIGHT



This construction gives positive, calculable ventilation, maximum light with the minimum amount of direct light rays resulting in a minimum amount of heat on those working beneath, as well as a minimum amount of steel in the monitor structure. The A-frame forms a pocket in which heat rising to the ceiling is further warmed by light rays coming through the glazing. This materially assists the ventilator in performing its work.

B—Bar spacing 18 $\frac{3}{4}$ ", 20 $\frac{3}{4}$ ", 22 $\frac{3}{4}$ " or 24 $\frac{3}{4}$ ". These spacings take respectively 18", 20", 22" and 24" glass.

Standard trim is Black Asbestos Protected Metal for Type B. Copper or Galvanized Steel for Type A.

Standard bars of black painted steel. A standard bar spacing of 22 $\frac{3}{4}$ " is recommended for most purposes. Prices for special Asbestos Protected Metal or galvanized steel bars on application.

Skylights designed for 25 pounds live load and 7 pounds dead load, with a maximum deflection of 1-30" per foot of span.

When ordering always give

Symbol W—Skylight width. (Back to back of angles at top and bottom. Maximum dimensions for this construction 6'4 $\frac{1}{2}$ " based on angles as shown).

Symbol L—Skylight length. (Give total length of openings).

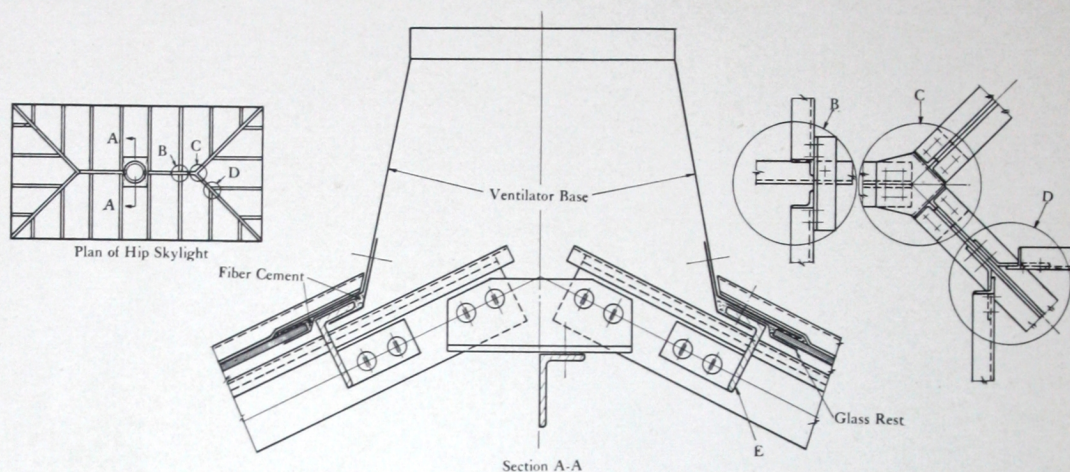
Symbol B—Bar spacing.

The following patents apply to Robertson Skylight Construction

No. 1,115,714	Nov. 3, 1914	No. 1,156,335	Nov. 12, 1915	No. 1,167,949	Jan. 11, 1916
No. 1,168,599	Jan. 18, 1916	No. 1,195,090	Aug. 15, 1916	No. 1,227,861	May 29, 1917
No. 1,243,020	Oct. 16, 1917	No. 1,277,755	Sept. 3, 1918	No. 1,280,913	Oct. 8, 1918

Licensed under Patents Nos. 775,635 and 775,636. Other patents pending.

ROBERTSON HIP SKYLIGHT AND VENTILATOR DETAIL



The plan illustrates the general type of Robertson Hip Skylights. Each order is built to specifications. The company does not standardize on this type as equally good results can be secured at less cost through the use of double pitch skylights.

A-A—Typical mounting of a Robertson ventilator base on a Robertson skylight.

Where other than Robertson ventilators are to be installed the customer must furnish a sketch showing the size of the base so that the angles, marked E, may be properly placed to receive the base. Also indicate whether the base will cover one or more lights of glass.

B—Method of connecting common bars to the ridge bar. Note that a strong, structurally correct, connection is secured by the use of the angle clip.

C—Method of connecting ridge and hip bars. Note that the connecting member is a gusset plate held firmly in place by a sufficient number of bolts to develop the strength of this connection. Hip connection plates are carried in stock for a pitch of 6" in 12"

D—Method of fastening jack bars to the hip bar. Bent plates and sufficient bolts are used to develop the full strength of this connection.

Skylights designed for 25 pounds live load and 7 pounds dead load, with a maximum deflection of 1-30" per foot of span.

The following patents apply to Robertson Skylight Construction

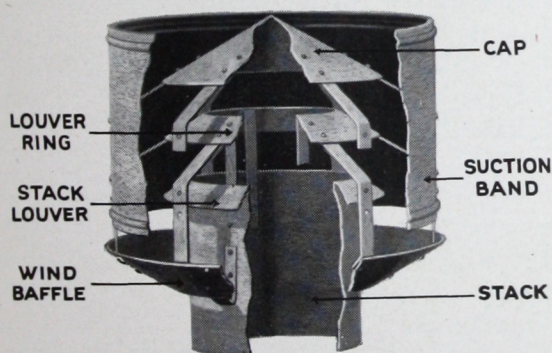
No. 1,115,714	Nov. 3, 1914	No. 1,156,335	Nov. 12, 1915	No. 1,167,949	Jan. 11, 1916
No. 1,168,599	Jan. 18, 1916	No. 1,195,090	Aug. 15, 1916	No. 1,227,861	May 29, 1917
No. 1,243,020	Oct. 16, 1917	No. 1,277,755	Sept. 3, 1918	No. 1,280,913	Oct. 8, 1918

Licensed under Patents Nos. 775,635 and 775,636 Other patents pending.

THE NEW ROBERTSON VENTILATOR

Pages 31 and 32 illustrate the New Robertson Roof Ventilator used in connection with or as a part of Robertson Skylight installations.

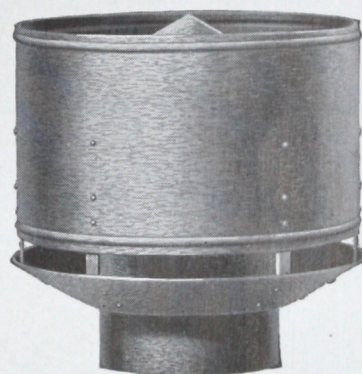
The New Robertson Ventilator is unquestionably one of the most important developments that have taken place during recent years in the field of scientific ventilation. It is a ventilator with an unusually powerful exhaust capacity. Every detail of its construction (see cross-section below) is designed, placed and proportioned to increase its ventilating efficiency.



The Robertson Suction Band multiplies the displacement or air-pulling area of the ventilator stack more than six times. Passing winds blowing across the top and bottom of this band create a tremendous suction in the ventilator stack which literally drags foul air, fumes, etc., out of the building.

The Ventilator Cap and the Ring Louver make the Robertson Ventilator storm-proof and exclude downward air currents. The Wind Baffle (an exclusive patented feature) and the Stack Louver provide effective protection against up-drafts from pitched roofs.

Because of its remarkable suction power and because it eliminates the effects of up-drafts and down-drafts, the Robertson Ventilator exhausts from 50 to 60% more air than an open pipe—a most unusual rating as compared with ventilators of other types.



The Robertson Ventilator is a strong, immovable rigidly constructed unit. It has no rotating parts to get out of order or require attention.

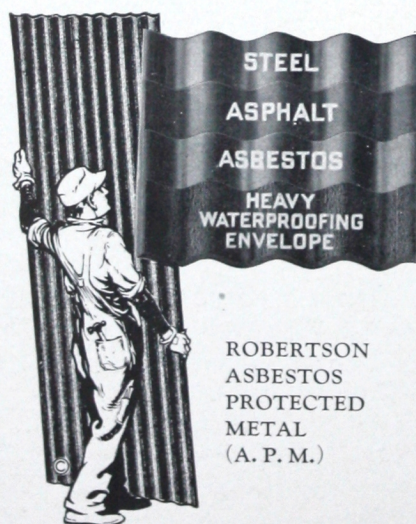
Robertson Ventilators are made of Robertson Asbestos Protected Metal, copper or galvanized steel in all sizes used in standard practice.

The H. H. Robertson Company maintains a Ventilation Engineering Department whose services are available to architects, engineers and building owners without obligation. Through the utilization of Robertson Ventilation Engineering Service you can be sure that your buildings will be ventilated with maximum efficiency and at lowest possible cost. Write for a copy of the Robertson Ventilation Engineering Service Bulletin.

ROBERTSON ASBESTOS PROTECTED METAL

The use of the Robertson Process of Metal Protection in connection with Robertson Glazing Construction has been discussed on page 5 of this catalog. The rust-proofing of skylight bars and sheet metal parts represents, however, only one of the adaptations of this method of protecting the metal used in building construction. The Robertson Process is best known and most widely used as a means of protecting metal sheets used for roofing and siding.

The H. H. Robertson Company manufactures Robertson Asbestos Protected Metal (APM) in the form of roofing and siding sheets, downspouts, gutters, general building trim, ventilators, etc.



The accompanying illustration shows a workman holding a typical Asbestos Protected Metal roofing and siding sheet. It also shows a "cut-away" section of an APM sheet and illustrates how the steel core is made rust, weather and corrosion-proof by three impervious protective coatings (1) Asphalt, (2) Asbestos Felt and (3) Waterproofing.

APM is a permanent building mate-

rial in every sense of the word. And there is no material of equal permanency that can be so easily and quickly erected. It gives years of service without requiring painting or repairs. It successfully resists the destructive action of smoke, steam, fumes, gases—all corrosive influences. For 19 years APM has stood the most severe tests of service on buildings of practically every type in almost every industry.

Prominent Users of APM

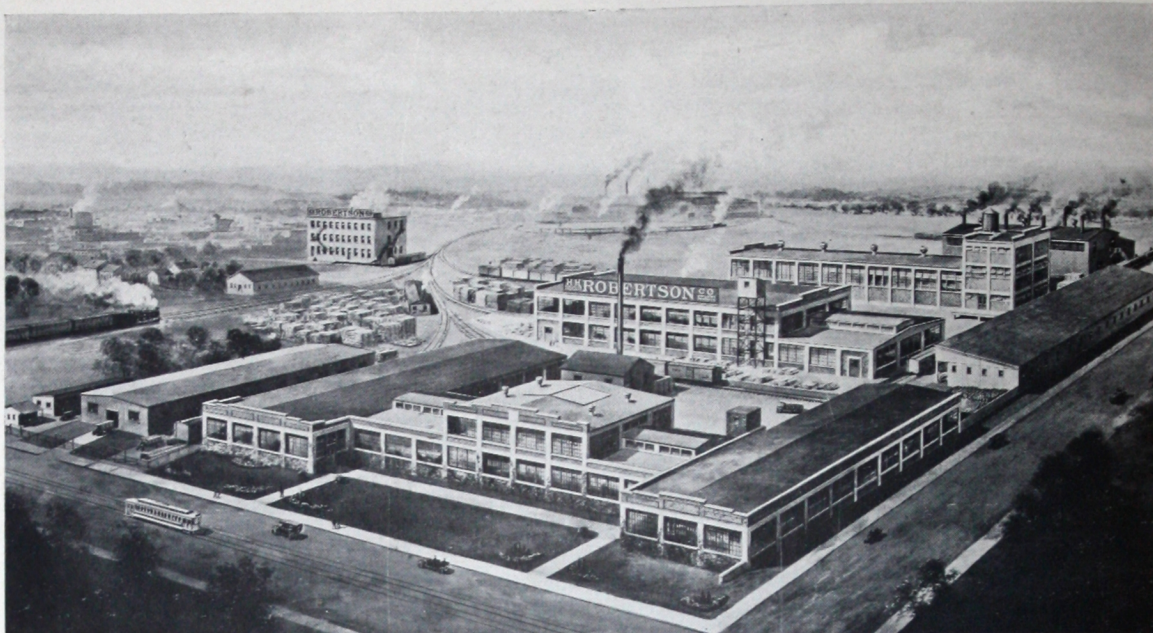
Crucible Steel Co. of America
Davison Chemical Co.
General Chemical Co.
General Motors Co.
General Refractories Co.
Hudson Coal Co.
International Cement Corporation
Lehigh Coal and Navigation Co.
Pennsylvania System
Pittsburgh Plate Glass Co.
Pittsburgh Steel Co.
Standard Oil Co. and Subsidiaries
Southern Pacific Ry.
United States Steel Corporation
Youngstown Sheet & Tube Co.

Behind Asbestos Protected Metal the H. H. Robertson Company has put an expert and comprehensive engineering service which will co-operate with architects, engineers and building owners to any extent that may be desired in the adaptation of APM to industrial buildings of all types. The Robertson Engineering Department includes a field force which will handle the erection of APM, Robertson Ventilators and Robertson Skylights in any part of the country. Write for detailed information on APM and Robertson Engineering Service.

Robertson Skylight Users

Following is a partial list showing users of Robertson Glazing Construction in different fields and in different parts of the country:

American Lithographing Co.....	Buffalo, N. Y.	Malleable Iron Fittings Co.....	Branford, Conn.
American Locomotive Co.....	Pittsburgh, Pa.	Marion Steam Shovel Co.....	Marion, Ohio
American Smelting & Refining Co.....	Murray, Utah	Matthiesen & Hegeler Zinc Co.....	La Salle, Ill.
American Steel & Wire Co.....	Cleveland, O., Worcester, Mass., & Donora, Pa.	Mayo Hotel.....	Tulsa, Okla.
Armour & Co.....	Williamsport, Pa., and So. Omaha, Neb.	Metropolitan-Edison Co.....	Reading, Pa.
		Midwest Utilities Co.....	Tulsa, Okla.
Bethlehem Steel Co.....	South Bethlehem, Pa.	National Lumbermans Bank.....	Muskegon, Mich.
Boston Consolidated Gas Co.....	Everett, Mass.	National Tube Co.....	McKeesport, Pa.
Bourne-Fuller Co.....	Cleveland, Ohio	New Cornelia Copper Co.....	Ajo, Ariz.
Booth Bowan Coal & Coke Co.....	Fairmont, W. Va.	N. Y. C. & H. R. Ry. Co.....	Gardenville, N. Y.
City of St. Paul.....	St. Paul, Minn.	Ohio University.....	Athens, Ohio
Calgary Institute of Technology.....	Calgary, Alberta	Orr Felt & Blanket Co.....	Piqua, Ohio
Calumet & Hecla Mining Co.....	Mills Station, Mich.	Ohio Power Co.....	Philo, Ohio
Campbell Co., Joseph.....	Camden, N. J.		
Centennial Memorial Building.....	Springfield, Ill.	Pacific Gas & Electric Co.....	San Rafael, Calif.
Central Indiana Hospital.....	Indianapolis, Ind.	Packard Motor Car Co.....	Detroit, Mich.
Central Tube Co.....	Ambridge, Pa.	Paige Motor Co.....	Detroit, Mich.
Chase Hotel.....	St. Louis, Mo.	Penn Ohio Power & Light Co.....	Lowellville, Ohio
Cadillac Motor Co.....	Detroit, Mich.	Pennsylvania Railroad Co.....	Numerous Locations
		Pierce-Arrow Motor Car Co.....	Buffalo, N. Y.
		Pressed Steel Car Co.....	Pittsburgh, Pa.
		Pullman Co., The.....	Pullman, Ill.
Dansard State Bank.....	Monroe, Mich.		
Davison Chemical Co.....	Baltimore, Md.	Riter-Conley Co.....	Leetsdale, Pa.
Denver Gas & Electric Co.....	Denver, Colo.	Roessler-Hasslach Chemical Co.....	Perth Amboy, N. J., and St. Albans, W. Va.
Dodge Brothers Co.....	Detroit, Mich.	Ryerson & Sons Co., Jos. T.....	Chicago, Ill.
Eastman Kodak Co.....	Rochester, N. Y.		
Easton Publishing Co.....	Easton, Pa.	Scottish Rite Cathedral.....	Guthrie, Okla.
Fisher Body Corporation.....	Detroit, Flint and Pontiac, Mich.	Sessions Foundry Co.....	Bristol, Conn.
Firestone Tire & Rubber Co.....	Akron, Ohio.	Shell Oil Co.....	San Francisco, Calif.
		Southern Pacific R. R. Co.....	Torrance, Calif., and El Paso, Tex.
		Southern Ry. Co.....	Ferguson, Ky.
Galena Signal Oil Co.....	Richmond, Calif.	Standard Pipe Line Co.....	Ida, La.
Georgia Institute of Technology.....	Atlanta, Ga.	Strathmore Paper Co.....	Mittineague, Mass.
General Chemical Co.....	Willow, Ohio	Stockham Pipe & Fittings Co.....	Birmingham, Ala.
General Motors Corporation, Cadillac Plant.....	Detroit, Mich.	Strawbridge & Clothier.....	Philadelphia, Pa.
		Spaulding Fibre Co.....	N. Tonawanda, N. Y.
		St. Croix Paper Co.....	Woodland, Me.
Henry Ford Hospital.....	Detroit, Mich.		
High School.....	Lincoln, Neb.	Traymore Hotel.....	Atlantic City, N. J.
High School.....	Manteca, Calif.	Tulsa Power Station.....	Tulsa, Okla.
High School.....	Ottumwa, Iowa	Turner Center Creamery.....	Providence, R. I.
High School.....	River Rouge, Mich.		
High School.....	Saginaw, Mich.	Union Iron Works (Bethlehem Steel Co.).....	San Francisco, Calif.
High School.....	Watertown, S. D.	Union Pacific R. R. Co., Shop Buildings.....	Omaha, Neb.
High School.....	Pittsburgh, Pa.	University of Illinois.....	Urbana, Ill.
		University of Kansas.....	Lawrence, Kas.
Indianapolis Athletic Club.....	Indianapolis, Ind.	University of Nebraska.....	Lincoln, Neb.
Indianapolis Union Station.....	Indianapolis, Ind.	University of Pennsylvania.....	Philadelphia, Pa.
Illinois Steel Co.....	Gary, Ind.	University of West Virginia.....	Morgantown, W. Va.
Kellogg Co., M. W.....	Jersey City, N. J.	Valley City Gymnasium.....	Valley City, N. D.
Kresge Co., S. S.....	Indianapolis, Ind.		
		Wanamaker, John.....	Philadelphia, Pa.
Libby, McNeill & Libby.....	Hall, N. Y.	Western Electric Co., Inc.....	Chicago, Ill.
Liberty Trust Co.....	Chicago, Ill.	Westinghouse Electric & Manufacturing Co.....	Pittsburgh, Pa.
Lilly Co., Eli.....	Indianapolis, Ind.	Whitall, M. J.....	Worcester, Mass.
Logan Square Trust & Savings Bldg.....	Chicago, Ill.	West Penn Power Co.....	Connellsville, Pa.



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